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THE NATURE OF CONCUSSION*

BY

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The approach to the interpretation of concussion through its history presents a kaleidoscopic panorama in which succeeding generations are seen attempting to solve the same problem in the light of the scientific knowledge available to them; the same patterns of thing recur in a new setting. The first solutions were vibratory and oscillatory, and were suggested by contemporary new work in physics; they were what we should now call neurogenic, although the neurological knowledge on which any satisfactory conclusion could be reached was still to come. We shall do well to remember that each succeeding explanation offered was in accord with the best information in physics then available. However incorrect it may seem to us, it was satisfactory to a large number of contemporaries, and bore the imprimatur of the leaders of thought of the day. Some 80 years ago the oscillatory theories were abandoned in favour of a new vascular hypothesis. It was suggested by the work of Goltz, who had impressively demonstrated that the effects of shock were caused by a paralytic vasodilatation.

In 1870 Hermann Fischer, in a paper that was to become famous, discussed a case of head injury shown at a clinical meeting the day before. He asked, "What is the anatomical basis of the picture?" Various people had made suggestions, usually on gross anatomical evidence. Thus Rokitansky (1856) had been satisfied that capillary apoplexy at the site of the injury, and maybe elsewhere, explained all the signs; and Nélaton (1847) had held a similar belief. Actually punctate haemorrhages were first described by Richard Bright (1831), who stated specifically that he did not think that they would account for the symptoms of concussion or coma. Fischer's own explanation was of a physiological kind, because in two cases that he had observed he found nothing but cerebral anaemia with congestion of the surface vessels and the dural sinuses. "You will ask," he said, "what sort of queer disease picture is this that to-day threatens the patient with the severest symptoms, all of which to-morrow will have passed completely away." He suggested, but immediately rejected, reflex vessel spasm as a possible cause of this anaemia, and replaced it with the postulate of long-continued vasoparalysis. Seven years later Ludwig Witkowski, after having first accepted Fischer's theory of vasoparalysis (and it is a remarkable error of medical bibliography that Fischer is usually credited with having postulated vasospasm), finally rejected it in favour of a neurogenic causation, its localization unspecified. Bergmann went through the same phases, while Kocher (1901) in his unnecessarily long and verbose book can be held to support all theories. Vasospasm at no time had reputable supporters, because the physiologists had proved that there were no vasoconstrictor nerves on the cerebral vascular tree—a belief supported by Leonard Hill, and not shattered until the work of Forbes and Wolff (1928) and of M. Riser (1936) and Villaret *et al.* (1936) provided the needed correction. Ricker (1919), again, postulated a vasoparetic explanation with prestasis and focal softening. In the meantime the theory of mechanical arrest of the circulation by an instantaneous rise of intracranial pressure at the moment of injury, suggested first by Strohmeyer (1864) and brilliantly put forward anew by Trotter in England (1932), won an army of adherents. Trotter stated that cerebral anaemia was the cause of concussion, which he defined as a state of paralysis instantly induced but with a strong natural tendency to rapid and spontaneous recovery and not necessarily associated with gross damage. Longer periods of unconsciousness were attributed to contusion, but as to contusion of what (except of the brain generally, with possible local bruisings and burstings) Trotter was silent. This will be recognized as a return to the neurogenic theory, although Trotter always spoke disrespectfully of those who believed in molecular commotion with widespread synaptic breaks—as well he might if the phrase is interpreted literally. In England, C. P. Symonds (1940) and I were critical of the vascular theory.

The apparent paradox arises, from a consideration of the most important contributions of the last two centuries, that in the main, however much the interpretations disagreed, the observations were correct. Although a great deal was added to the data of cerebral injury the anomaly remains that the most striking feature, the unconsciousness, was left unsolved. We shall see that the reason lay in the inability of the investigators to grasp the fact that commotion of the brain may upset its actions for much longer than a moment, the disturbance enduring longer and longer according to the severity of the concussive force. (I shall have more to say of this matter in a moment.) Nor could the majority conceive that anything below a cortical level could interfere with consciousness.

Experimental Effects of Concussion on the Brain-stem

The effects of injury showing themselves so often by alteration in the pupils, in the frequency and depth of respiration, in the pulse rate, blood pressure, and low-level somatic reflexes (the corneals, the pharyngeal, laryngeal, and swallowing), focused the attention of some workers on the brain-stem and on possible means by which such a low-level injury could come about. Hence sprang Duret's theory of cerebrospinal fluid shock, which provided a theoretically good explanation of the reason why a blow on the vertex should injure the vital bulbar centres; and he, together with Koch and Filehne (1874) and especially Polis of Belgium and Miles of Edinburgh, published convincing experimental evidence that low-level disturbances even as caudal as the spinal cord (in which gross lesions were more often found than many remember) did

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actually occur. Gavin Miller (1927) repeated much of this work, and was able to cause concussion in the heartless frog as had Schiff, Goltz, and Witkowski before him. The problems were restated and retested by Denny-Brown and Ritchie Russell (1941) in a most important experimental series in which the evidences of brain-stem paralysis were proved to be well founded, with the entirely novel discovery that concussion could much more easily be produced if the head were free to move when it was struck. The essential factor was the suddenness of the acceleration imparted to the head and, in different circumstances, of the deceleration. The immediate alteration in respiratory rhythm, in pulse rate, blood pressure, pinna and corneal reflexes found by others, were again observed. A vital fact was that concussion could be produced without deformation of the skull—a rebuttal of the common surgical pictorial representation of indentation of the skull compressing the brain. None the less, the active cause remains a sudden application of energy to the brain. It is important to note that Denny-Brown and Russell had been able to produce concussion in decerebrate animals. These experimenters had nothing new to offer on the cause of the most impressive feature of concussion —unconsciousness itself—since their animals were either anaesthetized or decerebrate. We can safely leave the fundamentals of concussion other than this last as resting on a firm basis of experimental proof linked with clinical observation, and conclude that whatever alterations in cerebral blood supply either accompany or follow a concussive blow are secondary or epiphenomena, and that the prime cause is a paralytic effect on the neurons of which the brain mass is composed, including those of the brain-stem.

Unconsciousness or Traumatic Stupor

The question is, What part is played by the cerebral hemispheres, the cortex, and the deeper nuclei in the concussional or contusional syndrome? The majority of writers have assumed that consciousness is mediated by the cortex, and it will be immediately conceded that of full consciousness in the psychologist's sense this is certainly true. What is more, the occurrence of fits, often of focal type, the development of paralysis and of post-traumatic mental disorders, and the discoveries made at necropsy all certified that cortical and subcortical lesions of various degree and in various situations could sometimes, but not always, be found at high levels of neural integration and were not to be denied their importance in the total clinical picture. Are these the cause of stupor? The experiments of Tillman (1899) on the sliding movements between grey and white matter because of differences in their specific gravity, the cover-glass experiments of Ferrari in Kocher's laboratory, searches into the histology of the cortex after injury (Jacob, von Holder, 1904), all attest this concentration of inquiry on the cortex. More recently Greenfield (1938) demonstrated the demyelinization that often follows severe injury. All these studies, save Greenfield's, ended without conclusions of a convincing kind, because the inquirers failed to realize what seems to be fundamental fact—that injury, that contusion, paralyses nervous actions without the necessity for the effects of the contusion to be either macroscopically or microscopically visible, as was correctly stated by Trotter in his classical definition. The proof lies in the vigorous scrutiny of the facts of concussion itself and of contusion of the spinal cord and peripheral nerves. Laboratory work on the passage of impulses along axons (Erlanger) and on transmission at the synapse agrees that these are easily disturbed without gross alteration in structure. There is much that we must learn about the living conditions of the neuron, single or in vast communal partnership, after injury; physiological analysis by electrical methods holds out more hope of success than anatomical study. We should become better able through biophysics and microchemistry to demonstrate electro-chemical deviations from normal under injury.

Turning to clinical study of concussional or contusional cases, we are presented with material which is almost too rich, coloured as it is by individual differences of the patients' personalities and behavioural possibilities, and we are driven to the conclusion that there is no single fact or any group of facts which will tell us the course of unconsciousness in head injuries without confirmation from other sources. I have long believed that the classical stupor–recovery–stupor sequence of intracranial bleeding might hold the key to the problem. I know now that it does so.

There can at this date be little doubt that traumatic stupor is produced by a low-level lesion—hypothalamic and brain-stem. Suggestions to that end have been made in the past by Heubel and by Breslauer (1914) in favour of the fourth ventricle, Knauer and Enderlen (1922) for the mid-brain. Both Heubel and Witkowski found that when they opened the skull of a frog and touched the fourth ventricle with the head of a needle the animal, after showing evidence of pain, fell into a completely comatose condition lasting a longer or shorter time; the same result could be got in rabbits. Witkowski held that this condition closely resembled concussion. Breslauer had witnessed the accidental injection of novocain through the foramen ovale into the posterior fossa in anaesthetizing the human trigeminal nerve—an act which produced stupor. On experiment he found that the injection of fluid into the posterior fossa of animals also had that effect. Something more than the tentative support to the doctrine of consciousness as a low-level affair has been adduced for non-traumatic causes by Penfield (1938) and by J. C. White (1940). In this country J. G. Greenfield also suggested it. Not only have animals been rendered unconscious by experimental injuries to the upper end of the fourth ventricle at pontine level but, what is more convincing, injuries inflicted on man on comparable areas, especially in attacks on acoustic neuromas, are usually attended, when fatal, by unconsciousness from the moment of operation. It is in fact one of the most striking of neurosurgical phenomena that unconsciousness can be so readily produced by disasters in the posterior fossa and that ventricular drainage, which reduces the hemispheral pressure to zero, has no effect in restoring consciousness though the dynamics of the cortical circulation and hemispheral tissue respiration must have been restored to normal. Nor does pressure of brief duration when generalized cause unconsciousness, as Browder in particular has shown in the human. I can support that observation. That it may do so in time none will deny, but then for the special reason that pressure sustained for some hours or days causes a prolapse of the temporal lobe on the compressed side (or of both lobes if the compressing agent is medial and more distant) into the tentorial hiatus. Here a cone is formed which compresses the diencephalon and rostral end of the mid-brain, and unless this can be relieved by the appropriate surgical measures unconsciousness will continue until autonomic breakdown causes death. This is the explanation of the fact that surgical mortality chiefly occurs in cases with unrelievable pressure cones or when bleeding into the mid-brain has already taken place. There is little doubt that a cone at this level is more frequent and more dangerous (because less easily relieved) than the better-known one at the level of the foramen magnum.

Focal Lesions causing Stupor

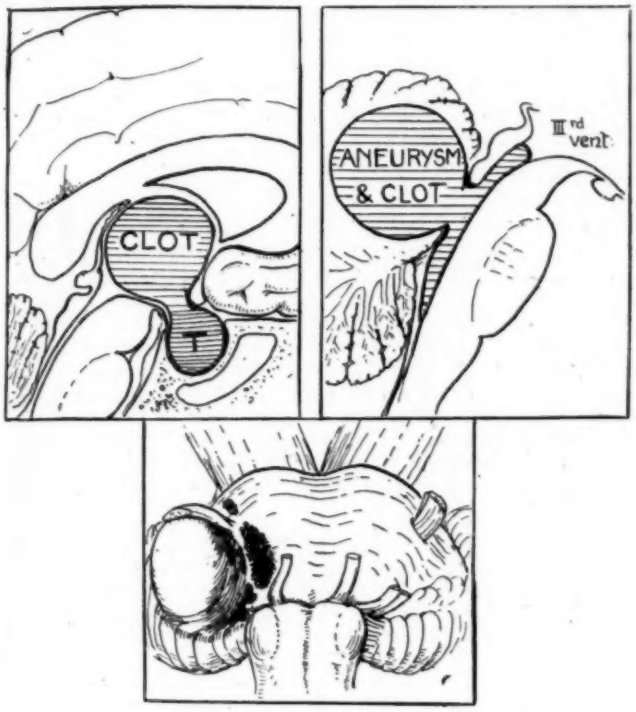
I have said that evidence on the localization of consciousness (and I shall shortly return to a statement of its nature) can be produced from other sources. Mention has been made of the fact that a posterior fossa lesion may cause unconsciousness. The notion that the stupor is caused by so severe a damming-back of the c.s.f. in the ventricles that cortical anaemia results is destroyed by the observation that the state may persist when intraventricular pressure is reduced to atmospheric. It is true that puncture may relieve, but the vital point is that it does not necessarily do so and that the patient may die with everything above the tentorium, or at least above the hypothalamus, apparently normal.

Clean-cut examples of brain-stem or hypothalamic lesions causing coma are presented by the following cases:

Case 1.—A. B., aged 48. Admitted Neurosurgical Service, Manchester Royal Infirmary. Referred by Dr. O. M. Duthie from the Royal Eye Hospital Dec. 10, 1942, on account of protrusion of right eye for 3½ months. The local signs are not important for the present discussion. A right-sided bone flap was turned down and the orbit unroofed, with the discovery of a small resistant mass in the midst of oedematous orbital contents. It was judged to be non-neoplastic, and the operation was concluded as an orbital decompression of the Naffziger type. The patient's pulse was rapid throughout the operation. She did not recover consciousness, and died 48 hours later in hyperthermia. Her pulse rate ranged between 174 and 152, with respirations in the 40s and 50s and a temperature that varied between 99.6° and 104° on the first day and between 102° and 105° on the

second. Occasionally she looked as if she might be about to wake up and half opened her eyes, giving the impression that she might be rousable and might speak if she could be sufficiently interested. All efforts to make contact failed and stupor returned.

The problem is, Why had this patient died? I suggested that a mid-brain or periventricular haemorrhage caused by anoxia in a long nitrous oxide anaesthesia might be the cause. However, at necropsy it was found (1) that the nodule in the orbit was a thrombosed aneurysm of the ophthalmic artery; (2) that there was no extradural clot; (3) that externally the brain was completely normal; (4) that she had died from the local compressive effects of the rupture of a second aneurysm in the cerebellar vermis with blood-clot plugging the iter (see Fig.).



This is a convincing example of the unconsciousness caused by a lesion at infra- and per-tentorial level; the fact that it caused death is less remarkable than its effect on total behaviour.

Case 2.—A woman aged 32 was referred by my medical colleague Dr. A. H. Holmes as a case of pituitary adenoma. What was unusual was the severity of her pain and the fact that she was drowsy and ill. Operation was performed and an unusually vascular chromophil adenoma cleared out easily. The patient failed to regain consciousness and died, much as did the previous case, in hyperthermia. Necropsy disclosed no contusion of the brain and an average small amount of subarachnoid blood in the basal cisterns. On section of the brain the cause of death was found to be a local clot some 3 cm. in diameter in a suprasellar situation occupying the third ventricle. Once more the essential fact is not that the patient died but that a localized clot in this situation caused stupor.

Case 3.—Mrs. G., aged 31, had the usual signs of a left-sided acoustic neuroma. It was evident from the neurological disturbances that this tumour was of very considerable size. At operation, Jan. 10, 1942, an exceedingly large tumour was subtotally removed, its complete extirpation proving to be impossible. During the manipulations her blood pressure rose to 180, the pulse falling to 60. Five hours after the operation she was moving her arms but would not rouse. She perspired freely and her face was flushed; there was a general vasomotor relaxation. The patient died in this condition 18 hours later with shallow rapid respirations and some evidence of pulmonary oedema. At necropsy the remains of the tumour were found to extend into the hiatus tentorii, and there were discrete haemorrhages in the mid-brain and pons. The cerebral hemispheres were in all respects normal.

In Cases 2 and 3, so far as could be observed, the cerebral hemispheres and the anterior hypothalamus were normal; although all the patients made movements they remained in stupor. These cases demonstrate the prime importance to consciousness of intact integrative pathways in a vertical direction, and demonstrate also that anatomically undamaged connexions in and between the hemispheres themselves are not sufficient to maintain consciousness. This is in some ways a surprising conclusion, but there is no doubt of its truth. Other examples might easily be adduced, but for the moment these will suffice while we turn to the essential point—the nature of this stupor, this state that we call unconsciousness.

The Nature of Unconsciousness

The description of diseased or abnormal states by delineating them as the reverse of a defined normal is not one which has commended itself to medical science. This holds true of definitions of consciousness and unconsciousness. We might accept the statement that consciousness is a state in which man (or animals for that matter) respond to environment in a manner which shows insight (cf. Penfield and Erickson, 1941). It is true to say that unconsciousness and the stages of recovery from it, even when they are long-drawn-out, can be comprehended by the reverse of the foregoing—that the patient does not to this or that degree show insight into the problems which his environment sets from day by day or hour by hour; but the statement lacks the necessary crispness. It would be more helpful to define unconsciousness, whether traumatic or otherwise, by a new term which designated more pointedly its nature, its pathological status in terms of neurophysiology. When we watch a patient recovering from concussion we see him sleeping most of the day and night, disturbed at first by only the most intense stimuli, aroused not by thirst or hunger but principally by the pain of bladder distension, made restless by it and sometimes also by pains in the head or elsewhere which he does not understand, cannot analyse. As he recovers, sleep is less compulsive; insight into his state increases. Conversely, when we watch, as occasionally we must, a patient dropping into coma, the picture is even more clearly derived from sleep. At first susceptible to both internal and external stimuli, interest is lost in food, incontinence develops, until stage by stage the hypersomnic periods merge into complete negativism and an unrousability from which there is no reveille. Step by step alterations in pulse rate, thermal control, and water balance take place which culminate in metabolic disaster, local or general, and death.

Parasomnia

We approach closer to the facts of clinical observation if we speak of unnatural or, in the case of concussion, of traumatic sleep rather than of unconsciousness. Traumatic stupor is a better term than unconsciousness because it has for most of us a certain sleep connotation. There is an advantage in inventing a new term to overcome these difficulties. Something is needed with a sleep- meaning but indicative of a condition different from ordinary sleep. The best that suggests itself to me is "parasomnia," a state in which there is no response to stimuli, verbal or mechanical, except those of a reflex nature. In other words, there is no response showing insight into or analysis of the problem set by the stimulus —at least no more than there is in a sleeping person. Variations in the picture can be regarded as the arrest of a moment of awakening and the giving to it of duration. This makes it a completely abnormal condition, and although we may for convenience regard it as an instantaneous freezing of a normal state, this must not blind us to the fact that it is pathological and associated with other abnormalities which further testify to that fact. Whatever words we use we should in future think in terms of sleep and wakefulness. The tossings, nose and body rubbings, mutterings, and unruliness occurring with some head injuries show that cortical actions continue, and compare with those observed by Kleitman (1939) in his studies of sleeping beings. And there is no doubt a high-level disturbance or inhibition of the cortex, partial or complete. But cortical lesions pure and simple do not seem to produce it, nor do massive excisions of the cerebral lobes, as I can well testify. No completely satisfactory human decortication is ever brought about by disease, and certainly never by surgery. We lack that piece of evidence. Yet a small central and basal injury certainly does so. This brings us, if the interpretation

which I have given is accepted, head on to the localization of the sleep centres variously placed in the anterior periventricular grey matter of the third ventricle or deeper in the posterior hypothalamus, in the anterior hypothalamus (meaning these areas plus some so far indefinable parts of the basal ganglia), or in the upper pons, or in all (von Economo, 1926, 1930; Fulton and Bailey, 1929; Ranson and Magoun, 1939; Globus, 1940; White, 1940). Nothing could be clearer than the fact that lesions in these areas have an effect on consciousness. Neurosurgery and neuropathology have done much to confirm the truth of observations made in the laboratory. And since lesions in these areas cause stupor and hypersomnia we cannot deny that trauma most probably produces its effects on consciousness in the same areas. It would be ingenuous to believe that there is a nucleus which controls sleep. The obnubilation of consciousness must be a highly complex action in which the whole nervous system co-operates. It seems more logical to postulate a "waking centre" (and by "centre" I do not mean a cluster of cells but a circumscribed brain area, injury to or stimulation of which causes certain constant results), damage to which would result in hypersomnia, ending in that mixture of sleep and illness which I have just called parasomnia. Although the area of these waking centres is roughly known we cannot always demonstrate injuries in them. As Symonds pointed out, it is no more "required" to show histological changes than it is in post-epileptic stupor and in Todd's post-epileptic paralysis. Denny-Brown and Russell and their forerunners all showed that animals could be killed without verifiable alterations in nervous structure. But it is a fact that mid-brain, hypothalamic, and pontine lesions can be demonstrated in some persons who die from injury as well as in those who die from tumours. The limits of the region concerned have still to be accurately mapped. Disturbances of the lower closed part of the medulla oblongata seem to be less able to disturb consciousness than those in the upper half of the fourth ventricle, but even that is unsure. The rostral extent is even more difficult to give with precision; it might extend into the palaeocerebrum wide of the third ventricle.

It would be a valuable step if we knew the behaviour not only of a single cell under trauma but of many cells, their rate and regularity of firing, the "boosting" required, the changes that occurred in cell respiration, and enzyme requirements. Further, we shall need to know the effects of trauma on electrical potentials and fibre transmission at different levels of the brain from the cortex to the cord and, if possible, at all levels at the same time. A valuable start was made by Dennis Williams and Denny-Brown (1941) and is being further elaborated by Earl Walker. The e.e.g. pattern is often very similar in sleep to that seen after concussion; there is the same disappearance of fast activity and the same appearance of high-voltage slow waves. As for the circulatory disturbances after head injury, there is a good deal of evidence that these happen in the severer cases. But whether they are occasioned by the stretching of the vessel walls by the agency of the momentary compression of contained blood, or whether they are the result of disturbance of a vasomotor centre or centres or arise from altered oxygen and carbon dioxide tensions, we have still to learn. The experiments of White show that there is a slight increase in brain mass after an injury, but oedema of a severe grade seems to be limited to the periphery of areas of actual contusion (Greenfield). We have to regard cerebral pathology after injury as a moving picture altering from day to day. Beyond a certain point there may be a progressive breakup of integration that must eventually be measurable in terms of cell metabolism as well as the transmission of impulses. Some petechial haemorrhages certainly arise secondarily, and are not the immediate effects of the violence. Changes in the vessel walls are visible within a few hours after injury, and these must effect the filtration of plasma elements and finally even of erythrocytes.

If we agree that the major phenomena produced by contusion are not primarily cortical, and are usually recovered from because in the majority of cases the disturbance is a physiological one without gross and persistent underlying alteration in structure, we can more properly understand that the results should so often be good and may be less inclined to accept easily a pessimistic view in prognosis.

Cortical Activities

The foregoing account has but lightly touched on the activities of the cortex in concussion, and maybe their importance has been unduly minimized. We know of them chiefly from psychological study and from e.e.g. analysis—two methods which are only in process of correlation. Reference has been made to the effect of a mid-brain lesion in interrupting integrative impulses in caudal and rostral directions and the profound effect that such a block seems to have on what might have been regarded as largely intercortical activities. These facts are fully in accord with Kleitman's views on the nature of sleep. A similar conception underlies the state of akinetic mutism described by Cairns, Oldfield, Pennybacker, and Whitteridge (1941). This again is a negative state affecting both intellectual and emotional tone, and in the one well-described case on which their paper depends its basis in a third ventricle lesion was well attested. Observations incline me to believe that parasomnia and akinetic mutism are not the same thing, but that many patients with cerebral contusion or with tumours can go through this mute state on the way to recovery or, conversely, towards coma. Speed of change may prevent its detection or development as a definable condition. For example, in two of the clinical cases recorded above there were moments when the state resembled akinetic mutism alternating with restlessness and mutism and parasomnia. The difference lies in the sleep propensities of the states; it is the dominant factor in the one, not so in the other. Nor does it seem probable that akinetic mutism is any more to be separated from general physical disorder than is parasomnia. It must be made clear that I do not regard the latter as a purely mental state; it is something more total than that. The recognition of these two states, if further observation by others confirms their validity, would mark a step in the unravelling of behavioural peculiarities at a lower level of psychological functioning than has so far been freely explored.

The long-lasting mental confusion, the Korsakov syndromes, the patchy or incoherent memory, which persist for many days or even weeks after some severe head injuries, can only be explained by disturbances of total brain functions which might, though not certainly, be due purely to cortical blocks. How far they derive from actual anatomical alteration we do not know. Common sense seems to say that they must have such dependence, but a certain amount of agnosticism is allowable. Occasionally the post-traumatic mental state resembles that seen after bromide intoxication and no doubt from other toxic agents. We do not yet know for how long the interactions of neuronal constellations may be disordered without actual damage in the sense in which we mean it at present. Perhaps, in the future, advances in the technique of recording action potentials will reveal abnormalities in the quality, quantity, and timing of cell discharges and axonal conduction, with a chemical or enzyme background of abnormality induced by the injury, disturbing the co-ordination of those "self-mending electrical leaks" (as Sherrington calls them) that underlie neural activities. Only in some such manner can one postulate a cause for that Jacksonian dissolution of nervous integration that signifies in different ways, at different stages, the nature of concussion. We suspect, though it is not yet proved, that general cerebral contusion causes a disturbance in the cerebral blood supply which may conduce to abnormality without necessarily originating it.

Trauma as a Disease Process

In conclusion, no statement on concussion would be complete without mention of a matter which has so far attracted no comment—the cause of death in those who survive the immediate injury. Necropsy material is insufficiently explanatory because we are dealing with a functional disorder. Explanation has run into wrong channels through the belief that abnormalities of action must always be accompanied by gross change (and in that term I include microscopy). The discovery of cortical injury (though much less than the surgeon can inflict with impunity), the finding of subarachnoid haemorrhage (though no more in amount than many with leaking aneurysms survive), the presence of relatively small quantities of subdural blood, are not enough to account for death, though

I should be the last to deny that all of these things can cause death when they are severe enough. But it must be strongly asserted that the findings in human beings are often disappointingly small—disappointing, that is, to the mind which is prepared only for anatomical findings. Yet it is not these things, nor the petechial haemorrhages of classical times, which tell us most; it is rather their variability or their absence. To find nothing would be in line with the most informative of experimental evidence. This raises the question as to how it can come about that an initial lesion severe enough to cause neural paralysis can be survived though death occurs hours or days afterwards. There is no question about the fact that this can and does happen; and it is certain, it is sure. Only one explanation suggests itself—that an injury sets going a self-propagating event that leads sooner or later to death. It would be a mistake to draw too much on analogy, and any explanation must be regarded as both speculative and tentative. But death from burns, from fractures, and from haemorrhages will serve as shorthand notes indicating at least a parallelism. We can only speculate at the moment on what the answer will be in the case of cerebral contusion. It is the fate of all of us to watch patients with cerebral lesions dying from something characterized by tachycardia and cardiac irregularity, from upsets of thermal regulation, from metabolic disturbance which we have not yet found a means to study properly, from something that bears the hall-mark of a disease process as much as, say, pneumonia. The old beliefs in the omnipotence of the bulbar centres has been corrected by the discovery of the vital centres re-representing them at and above the tentorial level. Conceivably it may become possible to demonstrate alteration in oxidation-reduction mechanisms in this area which will afford an index of cellular pathology. It seems legitimate to suppose that the physical effects of injury lead to affection of at least one enzyme system, the lack of which can for a time be repaired by the altered energies of others, which also in turn give out. Thus, step by step, dissolution comes about. Only in such a way can temporary survival with final extinction be given a cause. And it will be recognized that the level at which all of these happenings occur is in the more primitive but still no doubt extremely complex and largely integrated neural mechanisms considerably below cortical level.

Conclusion

Although the beliefs expressed above have minimized the importance of the cortex in the picture of concussion, it is not my belief that cortical disturbances are absent. Electrical records clearly show that they are frequent; while some patients, by confusion, confabulation, and lack of insight (sometimes for many days after return to consciousness), demonstrate that the whole brain integration continues to be disturbed. It is not possible at the moment to do more than speculate on the causes and mechanisms of this dysfunction. The real point that I have wished to examine is the nature of unconsciousness, and I have endeavoured to show that there is a body of evidence attesting to its production in a relatively focal manner, and that the focus is not, as has been so generally believed, in the cerebral cortex.

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NUTRITIONAL DEFICIENCY IN THE PATHOGENESIS OF DISEASE*

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More and more has the role of vitamin deficiency claimed our attention in recent years, and a variety of diseases and syndromes have been treated with a vitamin or a combination of vitamins. Frequently the reasons for doing this are obscure and the results of the treatment equivocal; and the relation between the condition and vitamin deficiency often remains difficult to assess.

Nutritional deficiency may be responsible for the production either of a recognized disease, of hitherto unknown aetiology, or of obscure signs and symptoms in an individual. For example, claims are sometimes made that vitamin deficiency plays a part in the production of renal lithiasis (Higgins, 1935) and certain muscular dystrophies (Bicknell, 1940). Again, a patient is seen with an unusual form of keratosis of the skin, or with oedema which does not easily respond to ordinary therapy, or with a sore tongue with few other signs or symptoms, or with an unusual type of subcutaneous haemorrhage: to what extent are vitamin A, vitamin B_1, riboflavin, and vitamin C respectively implicated in the production of these disturbances in the individual?

In this paper I shall consider certain general principles which might act as a guide in the evaluation of the part played by vitamins in the causation of disease. Just as we use Koch's postulates in determining the role of specific bacteria in causing disease, so we may lay down the following criteria for assessing the role of nutritional deficiency in causing disease: (1) It should be possible to demonstrate the existence of a deficiency of the nutrient; (2) deficiency of the nutrient should result in the production of the disease; (3) the disease should be cured by replacement of the deficient nutrient. To satisfy each of these criteria,† evidence may be collected in several ways:

Diagnosis of Nutritional Deficiency

Criterion 1.—Existence of deficiency
- A. General evidence of deficiency
  - (i) Evidence of inadequate diet
  - (ii) Evidence of defective absorption
  - (iii) Evidence of increased utilization
- B. Specific evidence of deficiency
  - (i) Laboratory tests for specific deficiency
  - (ii) Clinical tests for specific deficiency

Criterion 2.—Deficiency as the cause of the condition
- A. Evidence from animals
- B. Evidence from human beings

Criterion 3.—Cure of condition by correction of the deficiency
- Therapeutic test

Criterion 1: Existence of Deficiency

The first criterion is that there should be evidence of nutritional deficiency in the condition. This evidence may be either general or specific.

A. General Evidence of Deficiency

There may be evidence of a deficiency in any part of the pathway between the nutrient and the tissues.

(i) *Evidence of Inadequate Diet*

A dietary history is an essential first step in diagnosis. The following conditions are especially apt to lead to an inadequate diet.

(*a*) *Low Income Levels.*—On the whole, foods which are good sources of vitamins are also more expensive; cheaper foods supply mainly calories (Orr, 1936).

(*b*) *War.*—Wartime measures, such as the introduction of the national loaf and the vitaminization of margarine, together with rationing, the price control of foods, and the distribution of cheap or free milk and fruit juices, have decreased the disparity between the diets of various classes. Nevertheless, there are many who still

* Based on a paper read at a meeting of the Nutrition Society (Scottish Branch) at Gleneagles, Aug. 26, 1942.

† Certain exceptions to the fulfilment of these criteria are discussed below.

cannot afford to buy the whole of their meat or bacon ration or to spend much on vegetables. Moreover, since war leads to restricted imports, to a decreased man-power for food production, and to the destruction of crops and other foodstuffs, it may be a potent cause in the production of deficiency disease.

(*c*) *Season.*—An example of the part played by this factor is the low level of vitamin C in foods in the spring and early summer. It is therefore at this time that the effects of its deficiency are most likely to be seen (Harris, 1942).

(*d*) *Geography.*—Differences in food production and dietary habits lead to the classical examples of geographic endemic deficiency disease such as the association of beriberi with the consumption of polished rice and pellagra with the consumption of maize.

(*e*) *Special Diets.*—Possibly the commonest cause of adult scurvy in Britain is the consumption of a too rigid "gastric" diet by patients with peptic ulcer, without adequate precautions for assuring the supply of vitamin C (Harris *et al.*, 1936). Also, beriberi has been reported in food cranks who have lived on a diet containing excessive amounts of highly purified carbohydrates. It is possible that the well-known occurrences of pellagra in mental hospitals are partly due to the perverted food habits of the patients.

(*f*) *Institutions.*—Outbreaks of deficiency diseases are often reported from institutions; nor is this surprising in prisons and asylums, where the allowance for food may not be sufficient to supply even the necessary calories. But the unique nature of institutional feeding may result in an inadequately balanced diet even if economic considerations do not restrict the choice of food. In the first place, the food and its preparation, for a large number of people, are in the hands of a few individuals, who may easily, through ignorance or lack of care, be responsible for a diet of poor quality. Secondly, the preparation of food on a large scale introduces new problems in connexion with the preservation of its nutritive quality; it requires special care, for example, to preserve the vitamin C (King *et al.*, 1942).

(ii) *Evidence of Defective Absorption*

(*a*) *Water-soluble Vitamins.*—Many affections of the gastro-intestinal tract appear to decrease the absorption of vitamins of the B group. Hyperemesis gravidarum (Strauss and McDonald, 1933) and alcoholic gastritis (Minot *et al.*, 1933) are often associated with deficiency of vitamin B_1; in the latter condition there is probably a second factor in the diminished intake of the vitamin in the diet. Gastrectomy, colitis, and intestinal obstruction often lead to a complex deficiency of the vitamins of the B_2 group (*B.M.J.*, 1942).

(*b*) *Fat-soluble Vitamins.*—The absorption of these substances is bound up with the absorption of fat. In obstructive jaundice, in which the absorption of fat is decreased, there is diminished absorption of vitamins A (Breese and McCoord, 1940) and K; it is known that the difficulty in controlling haemorrhage in obstructive jaundice is due to this "conditioned" deficiency of vitamin K (Warner *et al.*, 1938a, 1938b). The effect of large doses of liquid paraffin in hindering the absorption of carotene is another example of induced defective absorption of fat-soluble vitamins (Rowntree, 1931).

(iii) *Evidence of Increased Utilization*

(*a*) *Pregnant and Lactating Women.*—In some degree pregnancy and lactation increase the demand for all the nutrients, including the vitamins. Osteomalacia and beriberi are examples of deficiency disease which may be precipitated by these increased physiological needs.

(*b*) *Heavy Manual Workers.*—It is likely that the utilization of many nutritional factors is greater with increased physical exertion. Many Europeans consume diets which probably contain no more vitamin B_1 than those consumed by many Chinese; the high incidence of beriberi among the latter is probably associated with the very heavy work which they do.

(*c*) *Fever.*—There is apparently an increased destruction of vitamin C and possibly other vitamins during fever (Abbasy *et al.*, 1936, 1937; Harris *et al.*, 1937). Usually the primary condition, such as tuberculosis or rheumatic fever, overshadows deficiency of the vitamin, but this deficiency may play a part in delaying recovery or in the persistence of certain signs.

B. Specific Evidence of Deficiency

This evidence may be obtained either by laboratory tests or by clinical tests.

(i) *Laboratory Tests for Specific Deficiency*

(*a*) *Vitamin Concentration in the Blood.*—The determination of the blood concentration of vitamin A, B_1, or C has often been used to assess the nutritional level in respect of these factors. The results of such investigations, however, appear to depend to a large extent on the immediate past diet, and give less indication of the more permanent nutritional state. A very short time on a diet high in vitamin A, for example, will lead to high blood levels although the subject still shows signs of deficiency (S. Yudkin, 1941); the converse is also true. To some extent this has been recognized with vitamin C: estimations on the whole blood or plasma have been found to be less reliable as indices of vitamin C nutrition than estimations on the white-cell layer (Heinemann, 1938, 1941).

(*b*) *Vitamin Excretion in the Urine.*—With the water-soluble vitamins, the amount excreted in the urine, and especially the rapidity with which large doses are excreted, have been useful methods for detecting slight deficiency (Harris and Ray, 1935). Such tests have been employed mainly with vitamin C, but they are also proving of value in the diagnosis of deficiency of vitamin B_1 (Banerji and Harris, 1939; Wang and Yudkin, 1940) and nicotinic acid (Kodicek and Wang, 1941).

(*c*) *Functional Tests.*—Slight deficiency of a vitamin often causes physiological or biochemical changes, which may be detected by the use of special techniques. Impaired dark-adaptation, increased capillary fragility, or a rise in blood phosphatase has been used to demonstrate mild deficiency of vitamins A, C, and D. A rise in pyruvic acid in the blood or urine, particularly after the ingestion of glucose, has been suggested as a means of recognizing early deficiency of vitamin B_1 (Banerji and Harris, 1939). Unfortunately these methods, although of great value, have been used very uncritically by some workers, and the published results have often been conflicting. The main reason for this is that tests such as those on dark-adaptation and capillary fragility appear superficially very simple to employ, but in reality require most careful application and rigid control (Hecht and Schlaer, 1938; J. Yudkin, 1941; *Lancet*, 1942; Yudkin and Ferguson, 1943).

(ii) *Clinical Tests for Specific Deficiency*

Clinical examination may reveal signs which are similar to those seen in the known deficiency disease, or they may be found in association with such signs.

(*a*) *Signs Resemble Those in Recognized Deficiency Disease.*—The realization that the neuritis of alcoholism and that of pregnancy toxaemia were due to deficiency of vitamin B_1 came, partly at any rate, from the recognition of the similarity between these and the signs of mild "dry" beriberi. But this type of evidence must be used carefully: it has led, for example, to the quite illogical use of vitamin B_1 in neuritis of many sorts, including sciatica (Roch and Sciclounoff, 1938).

(*b*) *Signs Associated With Those of Recognized Disease. In Individuals.*—In individuals with signs of a deficiency disease the presence of other signs whose pathogenesis is obscure suggests that these are also due to the same deficiency. Thus obscure neurological signs found in Cingalese prisoners appear to be due to deficiency of vitamin A, since other signs of A deficiency—e.g., phrynodermia—were also present; moreover, beriberi is uncommon in Ceylon, so that the neurological signs were unlikely to be caused by deficiency of vitamin B_1 (Nicholls, 1935). In view, however, of the frequency with which multiple deficiency occurs, caution must be used in interpreting such findings. Until recently, for example, it was thought that some of the changes in the skin and tongue in pellagra were due to the lack of the pellagra-preventing factor. Only after the latter was isolated as nicotinic acid was it found that these signs were due to a superimposed deficiency of riboflavin (Young, 1937–8; Sydenstricker, 1941). Incidentally, this type of evidence can be used in the opposite way: if certain obscure signs are rarely found in association with signs of a deficiency disease it is unlikely that they are due to this deficiency. Thus it was at one time suggested that disseminated sclerosis and subacute combined degeneration of the cord were due to deficiency of vitamin A, but the fact that other signs of this deficiency are rarely found in these conditions makes it unlikely. *In a Population.*—If a deficiency disease is common in a certain population the same deficiency may often be the cause of other less well defined conditions. Much of the so-called toxaemia of pregnancy in Hong Kong, where beriberi is common, has been shown to be due to deficiency of vitamin B_1 (Nixon, 1942).

Criterion 2: Deficiency as Cause of Condition

Our second criterion—that the signs should be reproducible by a deficiency of the suspected factor—may be applied either in experimental animals or in human beings.

A. Evidence from Animals on Experimental Deficient Diet

Analogy from animal experiments has proved very useful in recognition of signs of human deficiency. The production of haemorrhage due to lack of vitamin K (Dam and Schönheyder, 1934) and vascularization of the cornea due to lack of riboflavin (Wolbach, 1937; Bessey and Wolbach, 1939) are examples of this. On the other hand, such analogy must not be carried too far, as has been done with vitamin E and the production of neuromuscular disease (Bicknell, 1940) or vitamin A and the production of neurological disease (Mellanby, 1934).

B. Evidence from Human Beings on Experimental Deficient Diet

As might be expected, there are many difficulties in conducting such experiments on anything like an adequate number of subjects,

and it is not surprising, therefore, that few have been reported. It would be expected that the results would be very convincing, but in fact the conclusions reached are often conflicting. Thus some workers have claimed that a dietary deficiency of vitamin A produces a deterioration in dark-adaptation within a few days (Hecht and Mandelbaum, 1940), while others have found no change after five or six months (Steffens *et al.*, 1939). It is possible that these divergent results are due to such factors as differences in individual requirement, differences in the stores of the vitamin before the experiment is begun, and differences in the composition of the deficient diet—that is, the possible concurrent existence of other deficiencies.

Criterion 3 : Cure of Condition by Correction of Deficiency

Therapeutic Test

Wherever possible, the effect of correction of the supposed deficiency should be observed. Here again, however, it is unfortunately true that many reports in the literature of the cure of symptoms and signs by the administration of a vitamin are vitiated by the failure to observe certain general principles. The commonest source of error is the use of inadequate controls, and especially the failure to allow for spontaneous remission. On the other hand, even if deficiency really exists, negative results may follow the administration of the missing factor. Often this is due to inadequate dosing or to defective absorption; in such cases large doses, if necessary given parenterally, must be tried. Failure to cure may also be due to the fact that the pathological process has progressed too far; it is not always possible, for example, completely to cure long-standing peripheral neuritis of beriberi by the administration of vitamin B_1.

A less well recognized reason for the failure to achieve improvement by the correction of an existing deficiency is the simultaneous existence of other deficiencies. It is often overlooked that a diet is deficient in several factors, that the administration of only one of these may produce no improvement, and that this does not imply that the diet must necessarily have been adequate in this factor. For example, Peterhead children on diets undoubtedly deficient in vitamins A and D as well as many other nutrients were no better than the controls when given these substances (Sutherland, 1934). It was accepted in this experiment that deficiency of one or more other nutrients was the limiting factor in preventing improvement. Similar results were recently obtained in experiments on Cambridge school children (Yudkin, 1943). It is probable that the lack of effect of supplements of vitamin C in the oft-quoted experiment with South African miners (Fox *et al.*, 1940) was due to the similar existence of multiple deficiency; restoration of an adequate supply of this one substance without increasing the supply of the other nutrients was itself not sufficient to affect the health of the workers, apart from decreasing the number of cases of frank scurvy.

Lastly, when a positive effect is obtained by the use of a vitamin supplement it is not always legitimate to assume that this has proved the existence of deficiency. The fact that vitamin C is diuretic and hence relieves the oedema of cardiac failure (Evans, 1938) does not of course imply that the condition is due to deficiency of the vitamin. Again, if, as has been suggested, large doses of vitamin D have a favourable effect on psoriasis (Brunsting, 1938) it is not to be inferred that psoriasis is a deficiency disease. It is important, in other words, to distinguish between replacement therapy and pharmacological therapy.

General Comments

Diagnosis by rule of thumb, without consideration of biological realities, is to be deprecated no less with deficiency disease than it is with any other condition. We may mention here some of the more important considerations which must be borne in mind.

Multiple Deficiency.—Human dietaries are such that deficiency of one nutrient only is unlikely to occur. This means that Criterion 1 may indicate deficiency of a nutritive factor which is not the cause of the condition under investigation. It would appear that the signs which will occur in a multiple deficiency will depend partly on the relative extent of the various deficiencies and partly on the capacity of the organism to store the different dietary factors. On a diet completely deficient in the vitamin B complex, for example, rats will almost certainly die of deficiency of vitamin B_1 before developing signs of other deficiencies.

Individual Variation in Requirement.—It cannot be expected that all individuals have exactly the same requirements for the various nutritional components or that they would show the same signs when depleted of one or more of these components. It is possible that there are also racial as well as individual differences, as illustrated by the reported behaviour of Rumanian and Russian prisoners in a German camp during the last war. It is stated (Bigwood, 1942) that all were on the same diet, yet the former developed pellagra and the latter scurvy.

Other Constituents of the Diet.—It has been shown that signs of deficiency of riboflavin can be considerably aggravated if the deficient subjects are dosed with other components of the B complex (Sebrell and Butler, 1938; Sydenstricker *et al.*, 1940), and there is similar experimental evidence in dogs (Morgan, 1941). This provides another reason for considering the whole of the diet in attempting the diagnosis of deficiency disease.

Specificity of Tests for Deficiency.—No single test can be held to prove deficiency. There are, for example, other causes of poor dark-adaptation than deficiency of vitamin A; other factors producing increased capillary fragility than deficiency of vitamin C. It is possible also to have a high level of vitamin A in the blood coexisting with definite functional deficiency of this vitamin.

Finally, it should be stressed that, even if deficiency has been proved, it may be the effect rather than the cause of the condition. An extreme example is deficiency of vitamin C in tuberculosis, in which it is clear that no one would suppose that the deficiency causes the infection. On the other hand, it should be remembered that, even when it is not the ultimate cause of a definite pathological state, deficiency may be a predisposing cause. It is likely, for example, that deficiency of either vitamin C or nicotinic acid renders the individual more readily susceptible to ulcerative stomatitis.

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A. V. Hardy (*Publ. Hlth. Rep.*, Wash., 1943, **58**, 833) used sulphadiazine in the treatment of 19 chronic typhoid carriers, 4 convalescent carriers (including one treated as a case), 21 clinical cases, and 1 clinical relapse, with the following results. Quantitative cultural tests showed that sulphadiazine had a marked bacteriostatic effect on *Eberthella typhosa* in the enteric tract, but that the chronic carrier state was not terminated by this treatment.

THE PRISONER-OF-WAR MENTALITY

ITS EFFECT AFTER REPATRIATION

BY

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In 1919 Dr. A. L. Vischer wrote a small book entitled *Barbed-Wire Disease: A Psychological Study of the Prisoner of War.* It deals briefly with the factors producing this "disease" and with the prisoner's reaction to his environment during prison life. Dr. Vischer was a visiting doctor in German prisoner-of-war camps during the last war; he drew his conclusions not as a prisoner of war but as a psychologist studying a series of patients. His experience was vast, and his conclusions were drawn from an immense amount of data. In this short article I wish to give an impression not of a doctor examining his patients but that of a prisoner of war himself.

The number of prisoners ultimately returning to this country alone will be many hundreds of thousands, and that to countries throughout the world millions. It is quite obvious, therefore, that the organization dealing with repatriation of these people constitutes one of our more important post-war problems. The return of these prisoners will entail a flooding of our own country with men and some women who have experienced circumstances not necessarily harder but quite different from the majority of others. Those at home will welcome them as few are privileged to be welcomed, not because they have lived through worse conditions or have been more badly wounded or mutilated or have shown greater courage in facing more frightful scenes than others, but because they have lived in the valley of darkness.

During this period of enforced imprisonment they have adopted a certain mental attitude—a frame of mind compatible with camp life. Dr. Vischer has traced most carefully the origin of this mental attitude and discussed in detail its symptoms during camp life; he has not, however, described the symptoms after release from the camp. It is perfectly easy to understand the reason for a prisoner's depression while confined in a small space, crowded, and in an atmosphere of irritability. It is far less understandable that this attitude should persist on the prisoner's return to conditions to which he was normally accustomed. Broadly speaking, a prisoner's reactions in the camp are of minor importance in comparison with those which he shows on return to his normal life when he may again be beset by large responsibilities.

In medical textbooks we are familiar with what is called caisson disease. While in an underwater or compressed-air caisson such as is used in tunnelling, the bodies of the workers adapt themselves to an environment in which the atmospheric pressure is abnormally high. While working in this situation men show no abnormal symptoms, but when the caisson is raised or when they are released from it, the pressure falls back to normal and symptoms are apt to appear as a result of liberation of nitrogen bubbles from the blood. These symptoms do not always occur, but are usually the result of a too rapid fall in atmospheric pressure—that is, on a change of environment which the body finds too rapid for proper adaptation.

When a number of men are released from the same caisson, all of whom have been submitted to the same atmospheric pressure, some will show symptoms and some will not. A batch of men exposed to a high pressure for a long period will be more likely to show symptoms than a batch exposed to a low pressure for a short period. It is apparent, therefore, that the presence or intensity of these symptoms will mainly depend upon the following factors: (1) the individual himself; (2) the length of the period of immersion; (3) the pressure within the caisson. This response of a normal body to the process of recovery from exposure to an abnormal external environment is wrongly called a disease. It is the change-over from an adaptation to abnormal external influences. The returned prisoner of war is placed in conditions which show some parallel to those who suffer from caisson disease.

If we bear this parallel in mind we may say that in the repatriated prisoner the appearance of symptoms will depend upon: (1) the individual temperament; (2) the period of time within the camp; and (3) the gravity of conditions. (By gravity of conditions is meant not necessarily the degree of physical discomfort and the occurrence of atrocities, but the intensity of factors which the prisoner feels are of psychological importance.)

The effects of internment are twofold, and can crudely be divided into physical and mental. The physical effects are easily described and easily accounted for. Their treatment after release is probably a matter of good food, elementary medicine, and pleasant conditions. It is not the object of this article to discuss these problems, which are already fully recognized and can usually be treated without difficulty. The possibilities and limitations of physical rehabilitation are common knowledge among the medical profession. Unfortunately this is not the case in mental convalescence, where, as doctors, we still tend to flounder in directing treatment. Formerly, what we call common sense was the guiding principle, and it will remain so unless some very clear and rational indication for additional methods arises. The use of individual psychological treatment for any returned prisoner of war seems to be debatable; it may carry with it a public acknowledgment of mental abnormality, which must at all costs be avoided. This will be discussed more fully later when the long-distance guidance of such cases is described.

Barbed-wire disease, as has been said, is a misnomer. It is wrongly called a disease, and perhaps is better termed a mental attitude. This mental attitude is built up from a series of four phases through which the average internee passes. They are quite definite in occurrence but nebulous as to length and intensity. The officer prisoner of war has been chosen for discussion for two obvious reasons—first, the contrast between his normal life and his prison life is greater; and, secondly, during internment he remains unemployed and therefore has to rely on his own resources to dispose of his time.

Stage I: The Breaking-in Period

This is by far the most unpleasant of the four stages, because it is essentially the time of the acute mental stress which accompanies forcible adaptation to a lower plane of existence. The captive realizes very quickly the loss of friendly association, the loss of his own reputation and prestige, the absence of the sunshine of his own propaganda, and the power of the opposing propaganda. The lot of the man who was taken prisoner in France after three weeks of exhaustive retreat may well serve as an example. Within a month he was switched from the pleasant life of a pseudo-peacetime Army into the grip of Nazi persecution. Bewildered by the falsity of his own propaganda and disillusioned as to the might of his own country, hungry and fatigued to the extreme, he was moved into Germany. He was taken in by forced marches, given practically nothing to eat, and shot if he fell by the wayside. Lack of clothes, lack of personal belongings, and, above all, the vision of five to ten years as a prisoner of war were some of the factors which combined to make the prisoner a truly wretched creature. During this period there first arose the longing for freedom, for home, security, female society, and, above all, for sympathy. This suppressed longing for sympathy remains, and is stored up until the day of repatriation, when it crops up in different ways.

Stage II: Period of Convalescence

This is the period of recovering morale. The prisoner, having reached the depth of his depression, gradually reawakens to the life around him. He licks himself and his wounded pride, opens his eyes, and finds that far away on the horizon there is still a ray of sunlight left. Now he begins to shave, to undress when going to bed, to talk intelligently, to plan, and to organize his life. He grasps at the small things which give him pleasure and builds his life around them. At this time, typically, he gathers together what little personal belongings remain to him. He searches the camp for a piece of wood and fixes it to the wall near the head of his bed.

On this shelf he sets a photograph, a pipe, a favourite book, and anything else which represents to him a home in miniature. During the period of increasing morale the prisoner develops a sense of revenge, and is not long in realizing that revenge is impracticable. The consequent sense of frustration may easily be turned into a grudge against his own Government and higher Service officials. During this period of recovery the possibility of a reason or an object for living gradually emerges and forms itself from the all-enveloping fog of shattered values. Some find this image more quickly and visualize it more clearly than others. They are the fortunate ones who adapt themselves more readily to prison life. Others, who find the definition of this image more difficult, remain restless, discontented, more indefinite in their prison day routine, and are liable to store up from frustrated revenge a heavy grudge against the future if it does not come up to expectations. Let it not be forgotten that many prisoners of war have not seen a friendly person outside the barbed wire for over three years. This lack of external friendliness and encouragement plays a large part in focusing the prisoner's thoughts and ideas in introspective channels.

Stage III: The Lengthy Period of Boredom

During this period we see the prisoner in his usual state. He has done his best to accommodate himself to a life in a nutshell. He has looked into the uncertainty of the future and weighed up the possibilities of his eventual home-coming. As Dr. Vischer has pointed out, this uncertainty of the duration of internment is a demoralizing factor. The criminal prisoner can plan his life to the duration of his imprisonment, the prisoner of war cannot.

The significance of the absence of female society as a factor in the formation of the prisoner's attitude appears to give rise to much controversy. In discussing sexual deprivation it is important to distinguish between the restricted meaning of this phrase—i.e., actual sexual intercourse—and the broader meaning—i.e., the whole sphere of association between the sexes and all that it entails. There can be little doubt that, in this broader sense of lack of affection, sexual deprivation is not only a fundamental but *the* fundamental factor in the formation of the prisoner-of-war attitude. Deeply within the prisoner, but seldom expressed, there lies the fear of becoming a forgotten man. In 1941, after a year or so of imprisonment, some two hundred and fifty officers were gathered together to listen to a newly arrived Air Force prisoner. He was giving a précis of the events in England since Dunkirk. Interesting as his talk was, nothing stirred the audience so much as when he concluded by saying, "And, chaps—the girls still love you." The acute emotional reaction after this was plainly obvious. Further proof of this need can be seen in the meticulous care with which every word of letters is read and sifted. Hours are spent in making an elaborate checking and filing system for incoming and outgoing mail, and statistics are kept of its arrival.

The importance of the absence of actual sexual intercourse probably depends a great deal on the temperament of the individual. Even although it is untrue, it is quite common for an Italian prisoner of war to believe that he will become mentally deranged without this physiological act. I have heard this view expressed also by French prisoners, but never by British or German prisoners of war. A quite unfounded fear of impotence was frequently the reason for a prisoner's seeking medical advice and reassurance.

Overcrowding, with the impossibility of ever being alone to work, was a source of irritation and a good excuse for never working at all.

Apart from all these demoralizing influences there are several aspects of this life which produce other but equally damaging results. In the camp the prisoner is relieved from the struggle of life; he no longer has to work for his living, shoulder responsibility, or worry financially. Nothing that he does within the camp can relieve any threatening situation at home, and therefore his occupations lose their significance as acts of vital importance and become merely a pastime to amuse himself and defeat his own boredom. There is no stimulation for him to work, and what he achieves matters very little to his present state. He may spend three months making a model boat, and if he wishes he can spend six, for nobody will interfere; there is no competitive element, and time is of no importance. This attitude and this lack of responsibility tend to make him small-minded and childish. Conversation centres around small events within the sphere of the camp, events which are of no consequence to the outside world. This lack of stimulation builds up a predisposition to be unduly troubled by the everyday struggle for existence which has to be met, once again, after release.

The unemployed prisoner of war has three main ways in which he may lead a constructive life, the choice varying according to his temperament: (i) work which will be of value to him after release; (ii) welfare work among his fellow prisoners; (iii) escaping and sabotage. Most prisoners mould their occupation around one or more of these three. The minority which does not adopt any one of these seriously is building up greater difficulties at the time of readjustment following release.

Stage IV: The Repatriation Period

The returning prisoner arrives back in his home country keyed up to a high pitch and full of expectation for the pleasures to come. He is stimulated, after years of looking from the other side of the river, into a state of exaggerated optimism and false hope. Much, for the future, will depend upon the state of his home conditions. The repatriate who finds his family and his intimates as he hoped to find them, ready to listen sympathetically and to share his experiences, however trifling they may have been, is already half-way on the road to recovery. He must regain his emotional balance before he can again assume the responsibilities of his former life. Here in the bosom of his family he may live quietly, and gradually catch up with the years that have been lost to him. Here are those who have lived these years for him and are willing to share their experiences and help him over the gap of wasted time. From this sound emotional foundation of his convalescence he will stand every chance of regaining his normal appreciation of the difference between work and relaxation and of his need for both in certain proportions. Greater difficulties are apt to beset the returned prisoner who is not so fortunate. In wartime many factors tend to upset the happy balance of affairs, and consequently grave gaps and differences are apt to appear. During this repatriation period abnormal reactions are common; in fact, probably all prisoners of long standing will present symptoms to some degree. The factors on which the occurrence of symptoms will depend are those described above, with the addition of the conditions awaiting the prisoner on return home. Briefly, these symptoms are restlessness, irritability, disrespect for discipline and authority, irresponsibility, and even dishonesty. Other symptoms that occur are the fear of enclosed spaces, especially a fear of large crowds in confined spaces, cynicism, embarrassment in society, rebellious views against any code which tends to restrict the repatriate's activities, and a tendency to quick and violent tempers.

All men returning from over-seas, and especially those who have been in isolated areas for long periods, will show these symptoms to a certain extent, but seldom to so marked a degree as in the prisoner of war who has been through conditions which are usually held to be more damaging in the psychological sense: this, too, the prisoner knows and feels. It is important that the returned prisoner of war who shows these symptoms shall not be regarded as abnormal. Some may think him peculiar, rude, objectionable, and unreliable; but they must be helped to realize that he is a normal person attempting to bridge a gap in his life, often with poor or insufficient material.

This syndrome, when it exists, should pass off after six months to one year, and thus those affected should give rise to no concern. There are two types, however, which will give cause for anxiety: (i) the repatriate with exaggerated symptoms, (ii) the repatriate with persistence of symptoms. If individual treatment of any sort is ever indicated it will be in one of these two types. The first type is associated with symptoms of severe restlessness, irritability, emotional outbursts, acute discontent, and possibly excessive alcoholism. The second type shows chronic apathy, loss of initiative, and loss of

morale and of personal drive, resulting in the inevitable appearance of more serious neurotic symptoms.

The returning prisoner of war is ill equipped for the difficult period of readjustment. He is temporarily without the sheet-anchor of his daily routine, he has laid aside his habits of recreational relaxation, and he has lost the art of working for his living. With these handicaps he must readjust himself to his return to normal life. Should domestic trouble and unemployment further burden him he may succumb to his adversities and relinquish the struggle. It is reasonable to suppose that at this point a little help from someone who understands the position may be of great assistance.

Where, when, and how to apply this aid is a difficult problem. The ex-prisoner on returning to his home country has one main object in view—to reach his home as quickly as possible. Any form of assistance which prolonged the time between disembarkation and his arrival home would be doomed to failure. It would lack a vital factor—i.e., the recipient's co-operation. Similarly, except in a special atmosphere, any massing together of the repatriates after a period of leave would become difficult as well as being in most cases unnecessary. The necessity arises for some more distant and more subtle form of control—i.e., a form of long-distance guidance, an influence of which the repatriate is only just vaguely aware in the dim background, but which he can at any time make contact with should he feel the need for its help. It must be unobtrusive, so that it does not impress the majority with their need for assistance, but it must be accessible enough to be at hand if and when its assistance is required.

An organization for the aid of returned prisoners of war must fulfil certain requirements. The following suggestions are made to this end. The organization should possess (1) a means of informing all returned prisoners of war of its existence; (2) an interested and competent staff; (3) advice centres; (4) a rehabilitation centre.

These principles might be implemented in the following way:

1. To every returned prisoner of war would be posted a pamphlet containing very simple and brief advice for him during his period of so-called convalescence and informing him of the presence of an advice organization should he require it.

2. The advice organization might be staffed by individuals, preferably medical practitioners, who understand prisoner-of-war life, and who recognize and are capable of dealing with "release" phenomena. Medical practitioners who have actually been prisoners of war would be of great value in these circumstances.

3. The establishment of a prisoner-of-war club in all large towns—e.g., over 100,000 population—where ex-prisoners may forgather and know that, should they require advice, there is someone attending each club who understands their difficulties and is willing to help them. These advice centres may also be used by relatives seeking advice in handling returned prisoners, some of whom may prove difficult at home and refuse to receive any form of help.

4. The establishment of one rehabilitation centre for the country, with consultant psychologists and a trained rehabilitation staff. The patients at the centre would consist of those recommended from advice centres and by members of the medical profession throughout the country.

Summary

The typical prisoner-of-war mental attitude is discussed.

The four phases of significance in the formation of this attitude are described—namely: Stage I, the breaking-in period; Stage II, the period of convalescence; Stage III, the lengthy period of boredom; Stage IV, the repatriation period.

Emphasis is laid on the importance of the typical mental reactions which follow release as opposed to those shown while in the camp.

The great majority of returned prisoners of war give rise to no concern, but those showing excessive mental reactions or an undue persistence of symptoms may need assistance.

A scheme for aiding such cases is outlined.

A. B. Newman (*Amer. J. Dis. Child.*, 1942, **64**, 649), who reviews the literature and records 6 personal cases in children aged from 4½ to 12 years, states that peptic ulcer is comparatively rare in childhood: according to Hirsch the incidence is between 0.3% and 1%, and is equal among boys and girls. The diagnosis is more difficult in younger than in older children, in whom the disease tends to conform to the adult pattern. The importance of *x*-ray examination in obscure abdominal symptoms in children is emphasized.

A CASE OF ASPIRIN POISONING

BY

A. D. CHARTERS, M.D., D.T.M.&H.

Captain, E.A.A.M.C.

Records of aspirin poisoning are uncommon enough to warrant publication of a further case.

Clinical History

The patient was a European woman, aged 46, living in Kenya Colony. She had been worried about domestic trouble, and had suggested in a letter to a friend that she was about to commit suicide. On Nov. 24, 1939, she took 30 gr. of medinal, but awoke from its effects at 8 p.m. On Nov. 25, at 2 a.m., she swallowed 750 gr. of acetylsalicylic acid (150 5-gr. tablets of Howard's aspirin). The time of taking the drug was ascertained by the patient's personal admission after her recovery, and the exact dosage was proved by counting the remaining (350) tablets out of a previously unopened (500-tablet) bottle. There was no vomiting.

I was called to see the patient 14 hours after she had taken the drug. She was sitting in a chair. She was drowsy and disorientated for time, repeatedly mistaking the day of the week. She complained of tinnitus, requesting that the kettle be removed from the fire. Her respirations were rapid (40 a minute) and deep. Her pulse was 130 and the volume small. She was sweating and complained of the heat, in spite of the fact that the day was cold. She was not cyanosed and had no rash. Her pupils were small and reacted to light. Her reflexes were normal. An examination of the heart and lungs revealed no abnormality. Her tongue was clean.

A catheter specimen of her urine was of normal colour and had an odour of acetone. Its specific gravity was 1030. The reaction was very acid, the *p*H ranging from 4 to 4.3. The addition of perchloride of iron produced a deep violet colour. Rothera's nitroprusside test for acetone bodies was strongly positive. Gmelin's test for bile pigments gave a positive result. A moderate cloud of albumin was present on boiling. There was a marked reduction of Fehling's and a slight reduction of Benedict's solution. The yeast fermentation test was positive. After 16 hours of yeast fermentation the specimen was again examined for reducing substances, when it was found that, while still producing the same pronounced reduction of Fehling's solution, it was now negative to Benedict's test. This proved that, whereas the reduction of the copper solutions before fermentation had resulted mainly from the presence of salicyluric acid, there had also been a trace of glucose. Microscopical examination revealed the presence of several red blood corpuscles and pus cells, but no casts. In order to test the antiseptic action of the drug, a nutrient agar slope was inoculated with a sample (not a catheter specimen) of her urine. No colonies resulted after incubation.

There was a steady improvement in the patient's condition. Her progress is summed up in the following table:

Table of Progress

	1st Day	2nd Day	3rd Day	4th Day	5th Day
Temperature	Up to 99.4°	Up to 99·2°	Normal		
Pulse	130 and small	66; normal tension and volume	Normal		
Respiration	40 and deep	28	24; varies in rate	Normal	
Mental condition	Disorientation and drowsiness	Orientation normal; still drowsy	Still drowsy	Not drowsy	
Liver	Not palpable	Not palpable	Not palpable	Not palpable	Palpable but not tender
Urine:					
Rothera's test	++	++	−		
Reduction of Fehling's solution	++	++	−		
Reduction of Benedict's solution	+	+	−		
Ferric chloride test for aspirin	++	++	++	++	*Faint violet
Volume	Oliguria for 27 hours, during which, apart from one catheter specimen, there was no passage of urine				

* Further specimens unobtainable owing to recovery and discharge from hospital.

Differential Diagnosis

Apart from cases of idiosyncrasy, such a large dose of aspirin is required to produce toxic symptoms that poisoning by this drug is nearly always the result of attempted suicide, which may be accompanied by an effort to conceal the cause of the illness. In this particular case the evidence of witnesses, combined with the presence of the aspirin bottle at the bedside, greatly aided the

diagnosis, but, in the absence of such assistance, one or other of the following diseases might have entered into the differential diagnosis.

1. The combination of respiratory distress with tachycardia has to be differentiated from the dyspnoea of cardiac or respiratory origin. The absence of cyanosis and of abnormal clinical signs in the chest should serve to exclude any thoracic disease, though the presence of pyrexia might at first suggest the possibility of some infective illness.

2. The association of hyperpnoea with the presence in the urine both of acetone and of a reducing substance resembles a ketosis of diabetic origin, but the latter diagnosis is eliminated by the ferric chloride test for aspirin and by the yeast fermentation test, which demonstrates that the main reducing substance is not glucose. The diagnosis can be confirmed, if necessary, by a blood-sugar estimation.

3. Dyspnoea and signs of kidney damage also occur in renal asthma, but the absence of other signs of uraemia, together with the presence of aspirin and salicyluric acid in the urine, should readily differentiate the two conditions.

4. The mental symptoms, pyrexia, and respiratory disturbance may simulate a form of infective encephalitis, but the specific urine tests should clinch the diagnosis.

Treatment

The main principles of treatment in this case were as follows:

Elimination of the Poison.—(*a*) Gastric lavage was performed with sodium bicarbonate 1 dr. in one pint of water, after which about 5 oz. of the solution was left in the stomach. As the patient was not seen until 14 hours after taking the drug it is doubtful if this treatment can have been of much benefit. (*b*) She was given aperients. (*c*) She was encouraged to take as much fluid as possible, in order to hasten excretion of the drug by kidneys and skin.

Neutralization of the Acidosis.—Sodium bicarbonate 30 gr. was administered every two hours.

Abolition of the Ketosis and Treatment of the Toxic Hepatitis by Insulin and Glucose Therapy.—The treatment was begun on the second day with an injection of 40 units of insulin, combined with oral administration of 40 g. of glucose. This was followed by 20 g. of glucose every two hours for 12 hours. She was then given injections of 10 units of insulin morning and evening half an hour before meals, followed in each case by 40 g. of glucose three hours later.

A diet of high carbohydrate (with low protein and fat) content, in order to assist recovery from the hepatic damage and to avoid further strain on the kidneys.

Lumbar puncture was not performed, but a perusal of the literature reveals that Dyke (1935) and Neale (1936) record cases of benefit from this treatment, the former also reporting a purple colour on the addition of iron perchloride to the cerebrospinal fluid.

Commentary

Clinical Signs.—(1) There was a latent period of about 14 hours between the taking of the drug and the onset of severe toxic signs. This phenomenon has also been observed by Neale and by Biddle (1938). (2) The patient suffered from a mild pyrexia, which appears to be a common symptom, having been recorded by Neale and by Dyke. (3) The most characteristic sign was her marked hyperpnoea, associated with a strongly acid urine. It was caused by acidosis, presumably resulting from (*a*) the direct action of the acid radical of the acetylsalicylic acid, and (*b*) disordered metabolism, as exemplified by the acetone in her urine. The difference of opinion over the relative importance of these two factors has been discussed by Dyke, who points out that, whereas Quincke attributes the hyperpnoea to the direct action of the drug, Balázs considers that the sign occurs only in the presence of acetone in the urine. (4) Another feature was disorientation, which might be expected to occur in an organic reaction type of mental disorder. With the exception of drowsiness, no other mental abnormality was present, but symptoms such as restlessness, delirium, and terminal convulsions have been reported by several writers (5) That the poison caused a toxic hepatitis was shown by the hepatomegaly and by the presence in the urine of bile, acetone, and a trace of glucose. There was no jaundice. (6) There was also evidence of toxic damage to the kidneys; for, as stated above, the urine contained albumin, blood, and pus cells. (7) The oliguria—a symptom also noted by Andrews (1938)—was probably secondary to the excessive perspiration. There was no evidence of dehydration, though this sign has been observed by Neale, Biddle, and Dyke.

Course.—A study of the table of progress will show that there was considerable delay in complete excretion of the aspirin, the iron perchloride reaction being still slightly positive four days after the taking of the drug. Recovery after such a large dose of aspirin as 750 gr. must be uncommon. Neale (1936) records two fatalities after 200 gr. and 750 gr.* respectively, and Biddle (1938) cites a case of death after 500 gr. Evans (1938) describes a case of recovery after a dose of 1,500 gr., but his account suggests that he reached the patient soon enough to be able to hinder absorption by inducing prompt emesis, followed by gastric lavage.

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PROSTIGMIN IN THE TREATMENT OF DELAYED PERIOD

BY

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From 1940 several papers have been published in America and by workers from the Continent (Hechter *et al.*, 1940; Soskin *et al.*, 1940; Winkelstein, 1942; Carapetyan, 1943) on the action of prostigmin on delayed period; and although the results seem very promising no reports have as yet appeared in this country. This drug, made by Roche Products Ltd., has been given an extended trial at the Royal Free Hospital, and its effects on 90 patients are recorded below. It is claimed by those workers that prostigmin invariably precipitates the menstrual flow in all cases of recently delayed period not due to endocrine dysfunction, systemic disorders, or pregnancy. Their second claim, that it is consequently an alternative to the Friedman test with regard to its accuracy, is not dealt with in the present paper.

Mode of Action

According to the above-mentioned workers, "hyperaemia is probably an important and constant factor in menstrual bleeding." This hyperaemia (*a*) is a result of oestrogenic action on the uterus, and coincides with the property of the hormone of liberating acetylcholine (Reynolds, 1939), thus producing vasodilatation; and (*b*) is under the influence of the parasympathetic nervous system. This being so, it is easy to understand why physical, mental, and emotional upsets, and causes still undiscovered, by altering the parasympathetic control, give rise to a non-endocrine form of amenorrhoea in about 60% of cases. Coincident with this the diminished formation of acetylcholine within the uterine tissues causes a lack of vascular response. This deficiency could be rectified by the administration either of acetylcholine itself or, better still, of a chemical agent such as prostigmin which potentiates the naturally occurring acetylcholine in the uterine endometrium by inhibiting acetylcholinesterase, as in the treatment of myasthenia gravis. It is thus possible to produce hyperaemia similar to that following oestrogenic action without the ill effects which may result from the further addition of acetylcholine (Perlow, 1939).

Description of Treatment

Choice of Patients.—"Unsuitable patients" were those with obvious endocrine disturbances, a history of long-standing amenorrhoea, or obvious menopausal symptoms though the menstrual delay was relatively short. Nine such patients were treated without success, and were not included in our series of 90 cases. The ages of the patients varied from 16 to 47 years and the duration of amenorrhoea beyond expected menstruation from 3 to 47 days. Out of the 90 recorded cases 30 either were known to be pregnant before treatment began or were later found pregnant on clinical or biological investigation. They were therefore not expected to respond to treatment, which in no case caused bleeding to occur.

* The dose mentioned is 150 tablets, but it is assumed that each tablet contained 5 gr. of aspirin.

Technique.—The routine adopted for patients with previously normal or only slightly irregular menstrual histories consisted of one intramuscular injection of 1 mg. of prostigmin on three successive days, this treatment being discontinued if after the first or second injection the menstrual flow was restored. With the exception of two cases which failed to respond, the longest interval between the last injection and the onset of menstruation was about 72 hours. These periods were normal in quantity and duration, and in two cases biopsy proved the flow to be of a truly menstrual character.

Table of Results

Group	No. of Cases	Bleeding Occurred
1	30	Nil
2	24	82·8%
3	36	94·5%
Control ..	10	Nil

Group 1: Pregnant patients.
Group 2: Poorly selected cases; ½-mg. doses of prostigmin injected, only occasionally 1 mg.
Group 3: Properly selected cases; 1-mg. doses given from the beginning.
Controls: Out of Groups 2 and 3; sterile water injected.

Illustrative Case.—A 2-para. Has always had regular periods, and presented herself in March and April with a delay of three days each time. She was treated with prostigmin. After one injection of 1 mg. on each occasion a normal period started. In August she had a delay of 8 days. Two full courses of prostigmin at an interval of 8 days had no effect. An A.-Z. test was returned positive, and later the pregnancy was confirmed clinically.

Complications

A number of patients complained of frequency of micturition and giddiness. One woman with a menstrual delay of 8 days complained, 20 minutes after the second injection of 1 mg., of "a film before my eyes, strong palpitations, sickness, and a terrific rush of water which came out of my mouth." She rapidly recovered from the attack without treatment. The action of prostigmin on the salivary secretion may conceivably have been the cause of some of these symptoms (Wright, 1940). This was the only really unpleasant incident in the series.

Conclusions

It appears that the age of the patient and the length of the menstrual delay are not decisive points in selecting the cases; some observers have reported successful treatment in patients with a delay up to 52 days. The character of the previous menstrual cycle, which should have been quite regular or have shown only slight variations, is of greater importance. Prostigmin is reliable in its action, as is shown by its success in 94.5% of this series. One wonders whether the two failures may not have responded to a fourth injection or to slightly larger doses. The drug causes some minor discomfort of a transient and not serious character, but it is quite safe and pregnancy is not disturbed.

The type of patient we had to deal with raises the question whether a wait-and-see policy or any other "psychological treatment" may not have been followed by similar success in a considerable percentage of cases. The injection of sterile water in 10 cases, previous to the proper prostigmin course, gave entirely negative results. Even if it were true that in cases of "functional amenorrhoea" the period will appear sooner or later with rest, tonics, etc., it should be borne in mind that prolonged amenorrhoea may lead to atrophic changes in the uterine muscle. The results are encouraging, and prostigmin deserves further clinical trial. We would suggest that the drug should be tried in all cases of delayed period except those of endocrine origin and those in which pregnancy has been established. Further clinical work may also reveal interesting effects of prostigmin in cases of dysmenorrhoea.

Summary

Ninety cases of amenorrhoea were treated with prostigmin. From 1 to 3 injections of 1 mg. were given.

The results obtained were favourable: in 94.5% of the cases of delayed period not due to pregnancy the menstrual flow was restored.

Prostigmin is safe; from its use no serious ill effects were observed. There is no tendency of the drug to interfere with the course of pregnancy.

This treatment should be reserved for cases with a previously regular or only slightly irregular menstrual cycle.

I wish to thank Miss G. Dearnley, honorary gynaecologist of the hospital, for allowing me access to her cases.

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Medical Memoranda

A Case of Dysentery associated with Bact. alcalescens

The following case may be considered of interest seeing that only in the last few years has *Bact. alcalescens* been recognized as an organism capable of producing acute dysentery. Nabarro and Edward's (1939) paper on this subject has induced us to regard the case as worthy of record.

Case Record

Mrs. M., a nursing sister aged 25, was admitted to hospital on Sept. 9, 1941, with a history of intermittent diarrhoea for six weeks. After admission her stools presented typical dysenteriform appearances, and she was given appropriate medicinal and dietetic treatment. At no time was she acutely ill, nor did she have much pain. Under treatment she improved, but blood and mucus in small amounts persisted in the stools for some weeks. On Sept. 9 her stool, submitted before admission, consisted of gross blood-clot without visible faecal matter; it was cultured on two Wilson and Blair plates and tetrathionate broth (paratyphoid infection was suspected), also on two MacConkey plates. The Wilson and Blair plates proved to be entirely negative. Both MacConkey plates were covered by a profuse growth of non-lactose-fermenter with a few colonies of *B. coli*. The non-lactose-fermenting organism was identified from its cultural and fermentative reactions by the E.M.S. Laboratories as *Bact. alcalescens*, but was not agglutinated by either of the two sera available for this organism in the National Collection. Stools examined on Sept. 28 and Oct. 10 and 18 all contained small quantities of blood-stained mucus, and all, on culture on MacConkey plates, gave a heavily preponderant growth of *Bact. alcalescens* with only a few colonies of *B. coli* and *B. lactis aerogenes*. Serum examined on two occasions showed no agglutinins for the typhoid-paratyphoid group. Serum obtained on Oct. 18 showed no agglutinins for the patient's own strain of *Bact. alcalescens*. This was confirmed by the E.M.S. laboratories, which also tested for agglutinins for all the available strains of dysentery bacilli, with a negative result.

From Nov. 4 a live broth culture of *B. acidophilus* was administered daily for a fortnight. A stool examined on Nov. 8 contained no blood or mucus, and gave a negative result to tests for occult blood, and on culture showed only *B. coli* and *B. lactis aerogenes*. A stool examined on Nov. 21 contained no blood or mucus, but on culture a small number of *Bact. alcalescens* were found, with numerous *B. coli*. As the patient was now free from all symptoms she was discharged from hospital.

It has been suggested that the absence of agglutinins is against the causation of dysentery by *Bact. alcalescens* in this case. We find this hard to believe in view of its presence in overwhelming numbers and the complete failure to discover any other cause in spite of repeated examinations.

The apparent clearing up of the remaining symptoms after the administration of *B. acidophilus* culture is suggestive, and might, we think, be of use in other similar cases.

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FRANZ A. HEIMANN, M.D., L.R.C.P.

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A Case of Cystic Hygroma

The following case may be considered unusual enough to warrant publication.

Early in Sept., 1942, a child aged 20 months was brought to me by her mother, who had noticed a swelling in the left side of the neck, gradually becoming more apparent since birth. I found a rounded swelling above the outer half of the left clavicle, and diagnosed a lipoma. I advised leaving it alone unless it showed signs of growing or caused pain. About a year later she was brought back to me with the complaint that the swelling was growing. This was apparent on examination. The child was admitted to Harrow and Wealdstone Hospital, and on Sept. 25, 1943, under general anaesthesia, a large cystic tumour was dissected out apparently complete.

It extended from one and a half inches below and behind the left clavicle to a point near the middle line of the neck behind and deep to the trapezius, and was also adherent to the posterior border of the sternomastoid. The cyst was multiloculated and contained clear straw-coloured fluid. The pathological report from the Middlesex Hospital laboratory was: "The mass consists of oedematous connective tissue with varying-sized spaces lined by a very thin layer of endothelial cells. A fair number of blood vessels are present, but no blood spaces. The picture is that of a cystic hygroma."

The wound was drained for 48 hours owing to the size of the gap, and healed without any apparent discomfort to the child.

HAROLD E. THORN, M.B., B.S.

Thrombocytopenic Purpura following N.A.B. Injections

This is a case of thrombocytopenic purpura following N.A.B. injections in a congenital syphilitic. It is placed on record because of the severity and acuteness of the symptoms and extreme reduction in the platelet count.

CASE HISTORY

The patient, a soldier aged 30, was admitted on April 20, 1943. His complaint was bleeding from the gums for three days, bruising of the limbs, and petechiae all over the body for two days. He gave a history of having been treated with bismuth and arsenic for the past eighteen months for syphilis. The bleeding from his gums started about four hours after his last arsenic injection. He had o previous history of bleeding.

On examination the patient was seen to be a well-nourished man with a good colour. No clinical evidence of anaemia was present. There were petechial haemorrhages all over his body, large bruises on his limbs, and a slight oozing of blood from his gums. The spleen was not palpable. No abnormality was detected in heart or lungs. His pupils were equal, central, and circular, and reacted to light and accommodation. Knee- and ankle-jerks were absent and plantar responses were flexor on both sides. There were no sensory changes. His blood count on admission was: R.B.C., 4,130,000; W.B.C., 5.800; Hb, 78%; C.I., 0.95. The differential white cell count was normal. Platelets numbered 4,130 per c.mm. The red cells showed anisocytosis, with many crenated forms. There were no nucleated red cells. Clotting time was 6½ minutes (normal 4 minutes) (capillary method used). Bleeding time was 14 minutes (normal 3 to 6 minutes).

On April 22 the patient complained of acute pain in the right costo-vertebral angle extending down to the groin, and passed blood-stained urine. He was given vitamin P, ascorbic acid, sodium thiosulphate intravenously, and massive doses of potassium citrate. On the 23rd the bleeding from the gums and the haematuria increased. During the day one pint of Group O (IV) blood was transfused as a slow drip. There was a slight improvement in the patient's condition after this, and the bleeding from the gums became much less. His blood count was now: R.B.C., 4,020,000; W.B.C., 11,700; Hb, 76%; C.I., 0.95. Platelets had fallen to 3,000 per c.mm. On the 24th it was noticed that there was a rather diffuse swelling just beneath his mandible. He was given two pints of whole blood by slow drip (5½ hours). He improved a little after this, and the bleeding from the gums almost stopped. On April 25 his gums started to bleed again and he had haematuria. He was given 1 c.cm. of collosol calcium every six hours and 2 c.cm. of anahaemin intramuscularly. That night he seemed very much improved, but in the early hours of the 26th he suddenly died.

At necropsy the findings were as follows: "There were numerous petechiae all over the body. There was also slight jaundice. The lungs were oedematous and the trachea was filled with blood-stained fluid. There was a recent pleurisy. The external surface of the heart was covered with petechiae. There were large haemorrhages into the mesentery. The liver (1,475 g.) was congested, and there were numerous petechiae on its surface. The kidneys were congested and the pelves filled with blood-clot. The spleen (250 g.) was soft." The bone marrow was, unfortunately, not examined.

DISCUSSION

In 1930 Bamforth and Elkington recorded four similar cases following N.A.B. and other antisyphilitic preparations. They could find only 19 cases in the literature, and 10 of these were fatal, treatment with blood transfusion and liver extract having no effect. Scarborough and Stewart (1938) and Scarborough and Horne (1940) showed the value of vitamin P (hesperidin) in the treatment of purpura occurring as a toxic manifestation of arsenic and bismuth in the treatment of syphilis.

In the present case vitamin P and all treatment proved of no avail. Blood transfusions caused only temporary improvement in the condition.

I am indebted to Dr. T. J. Hennelly, medical superintendent, for permission to publish this case, and to Dr. J. M. Naftalin for carrying out necropsy and laboratory investigations.

G. M. LEWIS, M.B., B.CH.

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Reviews

TECHNIQUE OF BLOOD GROUPING

Blood Grouping Technic: A Manual for Clinicians, Serologists, Anthropologists, and Students of Legal and Military Medicine. By Fritz Schiff, M.D., and William C. Boyd, Ph.D. With foreword by Karl Landsteiner. (Pp. 248. $5.00.) New York: Interscience Publishers Inc. 1942.

Schiff's contributions to our knowledge of blood groups were numerous and important, and ten to fifteen years ago his book *Die Technik der Blutgruppenuntersuchung* was of great use. Before his untimely death Schiff had been for some years in America, and there he sought the help of W. C. Boyd, another well-known worker in the field, in the preparation of an up-to-date account of blood grouping somewhat on the lines of his German book. The plan of the book was Schiff's, and it was more than half finished when he died. From such a source a modern work was bound to be important, and *Blood Grouping Technic: A Manual for Clinicians, Serologists, Anthropologists, and Students of Legal and Military Medicine* is packed with information. It is essentially a book in which to look up points, and the arrangement of the matter in short sections numbered on a decimal system greatly helps reference and cross-reference.

Experienced workers will disagree with many things in it, and beginners will probably be confounded by the elaboration of the complexities and pitfalls. Blood grouping is far from being a simple business, and knowledge of the difficulties is essential for success; but in reading the book the reviewer has several times been struck by a sense of unreality in parts of the subject-matter, and has wondered whether some of it has been written by a theoretical rather than a practical blood grouper. From a lengthy list of things that might be criticized, queried, or contradicted, a few may be mentioned. On page 27 it is recommended that before use the efficiency of anti-A sera for A_2 cells should be tested; no mention is made of testing against A_2B cells in which the A may be very much weaker than in A_2. There is little danger of anti-A serum worth anything at all missing A_2 cells; the danger is with A_2B. Perhaps it is only inadvertently that it is suggested near the bottom of page 38 that 50% of group AB are A_2B. Actually the proportion of A_2 is the same in A and AB—about one in four or five in this country and the U.S.A. The advice on page 42 to use a technique which fails to disclose weak irregular reactions is very bad; this is the way to miss weak A in the AB group. On page 57, "Somewhat more practice and skill are needed for these [MN] tests than for routine blood grouping . . ." is an amazing understatement. Accurate MN work needs very great experience. The statement on page 88 that transfusion of blood of one group into a patient of a different group is "often" successful where the donor's cells do not meet homologous antibodies in the recipient's serum misrepresents the situation; "often" should be omitted.

The book is not merely a manual on technique; there are sections on transfusion, blood donor services, blood substitutes, the Rh factor, medico-legal grouping, anthropology, and, in fact, on everything found in other textbooks on blood grouping. Perhaps the subject is too big nowadays for really adequate treatment by one or even two authors. In the sections on transfusion, donors, and blood substitutes practically no mention is made of what has gone on in this country since the war began. Yet in spite of its defects the book will be very useful, and the reviewer intends to keep a copy handy in the laboratory.

INSECTS OF MEDICAL IMPORTANCE

A Handbook for the Identification of Insects of Medical Importance. By John Smart, Ph.D. With chapters on Fleas by Dr. Karl Jordan, F.R.S., and on Arachnids by R. J. Whittick, B.Sc. British Museum (Natural History). (Pp. 269; illustrated. 15s.) London: Printed by Order of the Trustees of the British Museum. 1943.

Identification of a pest insect is to an entomologist what diagnosis is to a doctor. In this country it is possible to have one's conclusions checked by a museum expert within a short time. But many entomologists and medical men are confronted with noxious insects and insect-borne diseases in the remoter parts of the world where they depend on their own powers

of identification. On such occasions the readily workable keys provided by this book will be of inestimable value.

The scope of the book is strictly defined by its title: for its 269 pages are allocated, to a large extent, according to the difficulty of identification and the medical importance of the various groups. One hundred pages are accorded to mosquitoes and 75 to the remainder of the diptera, while other insects (except the fleas) claim only 10. It is possible that Dr. Smart's intimate knowledge of and interest in the diptera have slightly exaggerated their importance as compared with other groups. Thus, the Reduviid bugs might claim equal attention to the Tabanid flies; but whereas the latter receive four pages, the Reduviids are dismissed in one short paragraph. However, it must be admitted that most of the medically important insects are indeed found among the diptera, and the book is well worth purchasing for the keys to this group alone. Dr. Jordan provides a welcome key to the important genera of fleas, with notes on many of them; and Mr. Whittick has added a useful section on Arachnids. The illustrations are admirable and the price, under present conditions, is extremely low.

THE MALE SEX GLANDS

The Sexual Glands of the Male. By Oswald S. Lowsley, M.D., F.A.C.S. Oxford Medical Publications. (Pp. 746; illustrated. 55s.) London: Oxford University Press. 1943.

In this book the work of several contributors to the *Oxford Loose-Leaf Urology* has been assembled and reprinted to form a single volume. Dr. Lowsley, the well-known authority on the prostate, has dealt with the embryology, anatomy, pathology, and surgery of that organ. His description of the surgery of the malignant prostate includes the more recent method of treatment with oestrogen and castration, but he is of the opinion that this does not obviate the necessity for radical operation whenever this is possible. In such cases he recommends the perineal approach. Drs. Hinman and D. R. Smith are responsible for those sections of the book dealing with the testicle and epididymis, and Dr. Gutierrez for the articles on the vas and the seminal vesicles.

The work is profusely illustrated and the general lay-out is excellent. It is primarily a book for surgeons, and if any criticism is to be raised it is that the non-surgical treatment of genito-urinary lesions has been less adequately dealt with than the surgical. The treatment of infertility by hormone therapy and the treatment of impotence by psychotherapy are scarcely mentioned, and there can be no doubt that they are of considerably more importance than any surgical measures. There are few authorities on male sexual disabilities who would agree with the authors that pathological lesions of the genital tract are to be found in the majority of impotent men. But *The Sexual Glands of the Male* is a book written by surgeons for surgeons, and it is not surprising therefore that the medical and psychological aspects of these important subjects are not adequately dealt with.

Notes on Books

A fourth edition has now appeared of Dr. W. WILSON INGRAM'S useful book *The Diagnosis and Treatment of Diabetes* (Sydney and London: Angus and Robertson, Ltd.; 6s. 6d.). In revising his text the author has added new matter at various places, and in particular the chapter on the complications of diabetes; but, to keep the volume approximately the same size (150 pages), he has deleted the chapter on the estimation of glucose in blood. This is essentially a book for general practitioners, many of whom have already found it a helpful guide, with clear-cut directions, especially on diets.

A 14th edition of Mr. H. WIPPELL GADD'S *Synopsis of the British Pharmacopoeia* has been published at 3s. 6d. by Baillière, Tindall and Cox. This edition comprises the six Addenda to the *B.P.* which have been issued since the main work was published in 1932. This additional matter will prove very useful to those seeking a brief summary of the changes contained in the official Addenda. The section on the Poisons Laws has been revised in accordance with latest Orders.

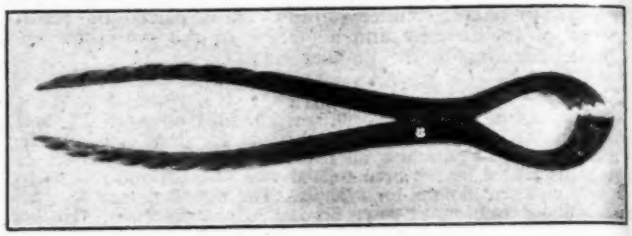
The *Calendar of the Royal College of Surgeons of England* for 1943 is published by Taylor and Francis Ltd., Red Lion Court, Fleet Street, at 2s. 6d. It has suffered a still further diminution in size owing to the shortage of paper, but all the essential official information is given and the Register of Fellows in alphabetical order appears in its accustomed place.

Preparations and Appliances

INSTRUMENT FOR MANIPULATION OF CENTRAL MIDDLE THIRD FRACTURES OF FACE

Mr. ARCHIBALD H. MCINDOE, F.R.C.S., F.A.C.S., writes from a Plastic Surgery and Jaw Injuries Centre:

Impacted central middle third facial fractures with retroposition of the alveolar segment require forcible disimpaction and advancement in order to obtain good dental occlusion. In carrying out this manipulation a strong grip of the alveolus is necessary, using an instrument which will do a minimum of damage to the buccal mucosa and none at all to the incisor



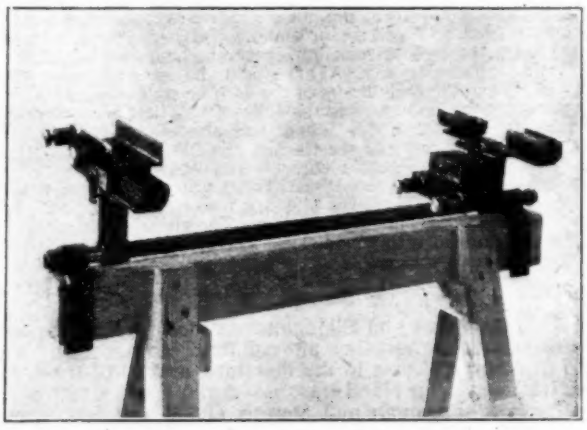
teeth. I have designed the forceps illustrated herewith for this purpose. The jaws are broad and strong and do not shut completely. Each is shaped to the area to be gripped and fitted with fine pin-teeth so that the alveolar bone above the incisor teeth can be firmly held but not crushed during the movement necessary for reduction. In practice they have proved most satisfactory for this purpose.

The forceps are manufactured by Messrs. Thackrays, Ltd.

RESUSCITATION BY ROCKING

Dr. W. F. CORFIELD, Medical Officer of Health for Colchester, writes:

You have recently published a number of suggestions for apparatus for rocking stretchers for Eve's method of resuscitation. In my opinion, none of them is as handy or complete as the apparatus suggested by Mr. A. V. Gooch, the Civil Defence Staff Officer for the casualty services of Colchester. This apparatus, as the illustration shows, consists of a bar which will fit on to a trestle, two chair backs, the edge of a table turned on to its side, or anything of this sort. Supported on the bar are two uprights, which will swing upon the bar when a civil defence stretcher has been placed in the slots upon them.



An important improvement of this apparatus is the addition of a block of hard wood hinged upon each upright with a channel fixed upon it into which the Army (Furley) stretcher can be fitted. This block can be tilted down out of the way when the C.D. stretcher is in use, or, if a Furley stretcher only is available, the block can be tilted up above the grooves for the C.D. stretcher and the channels on the blocks take the place of the grooves and receive the poles of the Furley stretcher. The apparatus is found to be most satisfactory with both types of stretcher.

The advantages are that it is handy (weight 7 lb.), can be immediately brought into action, is cheap to make, the cost being about 15s., and the whole apparatus is easily kept upon a shelf without taking up much room.

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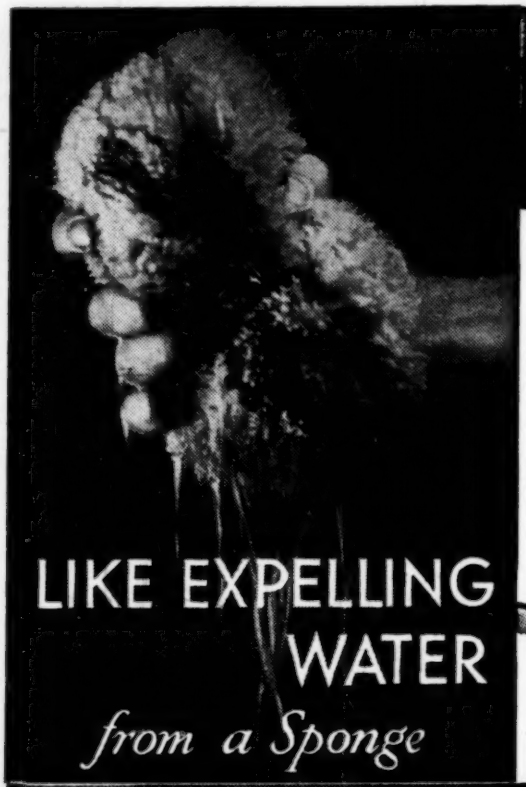

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BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JANUARY 1 1944

THE PLACE OF CONSCIOUSNESS

As the artist stands back from his work from time to time and contemplates it before proceeding to a further stage in its completion, so in the field of scientific observation it is necessary to pause now and again to contemplate the facts of observation already accumulated, and to see what general ideas may be drawn from them. There is an intellectual refreshment in this contemplation, and in what may be called the escape from an exclusive preoccupation with the mass of detail into the realms of general thinking; but there is more in it than this, for it is an essential step in any ordered quest for fresh knowledge. In this mood Prof. Geoffrey Jefferson, in his address before the American Neurological Association on the nature of concussion, which appears at the opening pages of this week's *Journal*, has thoughtfully reviewed the field of clinical and pathological data at our disposal, and has formulated some general ideas therefrom. In doing so, not only has he given his readers the refreshment they have learned to expect from his writings, but he has provided a welcome example of the order of general thinking of which we stand in so great need in medicine to-day.

The phenomena of concussion have found their latest description and analysis in the experimental work of Denny-Brown and Ritchie Russell. They include loss of consciousness, alterations in the depth and frequency of respiration, in the pulse rate and the blood pressure, and also in certain lower-level somatic reflex reactions (laryngeal, pharyngeal, corneal, and of deglutition): a symptom-complex which corresponds to that found in man by clinical observation. Of the component elements, all but the first, as Jefferson points out, may now be confidently attributed to a paralytic effect on neurons, including especially those of the hypothalamus and brain-stem. Changes in the vascular supply of the cerebral hemispheres may now be regarded as epiphenomena of secondary import. From this point Jefferson is led to consider the factors underlying unconsciousness, and the relative roles in its mediation of suspended function in cerebral hemispheres and in the deeply seated cerebral nuclei. He concludes that traumatic stupor is the consequence of a negative or paralysing lesion of hypothalamus and brain-stem; he cites the experimental evidence therefor, and gives three striking clinical case records of his own that point in this direction. The integrity of afferent pathways to the cerebral cortex is probably also impaired when unconsciousness supervenes on head injury, and the probable importance of these pathways has been stressed by Kleitman in his discussion on sleep and wakefulness.[1]

[1] *Sleep and Wakefulness*, University of Chicago Press, 1939.

Jefferson then proceeds to consider the nature of unconsciousness, and prefers the term "parasomnia" as more accurately expressing the picture of deep and abnormal sleep presented by the unconsciousness of the concussed subject. Any student of the vast literature on consciousness, unconsciousness, and sleep must feel that in the forming of clear and accurate ideas on these states we are sadly handicapped by the limitations and pitfalls of linguistics, and by our inveterate human proneness to hypostatize abstractions. The word "consciousness" has only to be uttered, heard, or read, and we at once find ourselves irresistibly entertaining the notion of some elementary and unitary state. Too soon this becomes an "entity" which we seek to "localize" somewhere within the nervous system. On the other hand, the clinical or experimental observer who sees sleep or hypersomnia to follow a local lesion in the neighbourhood of the walls bounding the third ventricle proceeds easily to postulate there a "sleep centre," or, more logically, a "wakefulness centre," the destruction of which allows the subject to lapse into sleep or stupor. In this facile process of anatomizing an abstraction the hypothalamus has become the site of election for hypothetical centres for wakefulness or sleep, and the role of the cerebral cortex in these functions has been correspondingly minimized. In short, there is a naivety in much current thought on these subjects that must convey to the critical student a strong sense of its remoteness from reality. A feeling of this kind is evident in Prof. Jefferson's paper, and indeed it is clear that we must have some deeper thinking as to what precisely we are referring to when we speak of consciousness before we can form any useful ideas about unconsciousness.

Surely there may be more than one mode of consciousness, and this possibility implies that there may be more than one region of the brain, or more than one system of neurons, that functions consciously. May not those who "locate" conscious functioning in the cerebral cortex, and those who—more in the fashion, if not more correctly—would place it in the region of the hypothalamus, both have some measure of reason on their side; and, further, may not the modes of consciousness thus located differ in range and quality? These are questions that must find some answer before we can proceed to find a place in the nervous system for unconsciousness.

A most suggestive approach to these problems has been provided by Kleitman in his evolutionary idea of wakefulness and sleep—a hypothesis that has received too little attention from those engaged in the study and interpretation of concussion and its manifestations. Kleitman draws a distinction between "consciousness of choice" and "consciousness of necessity." The latter is the consciousness of the decorticate dog, which is a fugitive awareness of and response to internal changes and bodily needs—hunger, thirst, and the need to empty bladder or bowels. Of the outer environment there is no awareness, and to events in it no response. Once the internal needs have been dealt with, the animal lapses into sleep again. Consciousness of choice is that aspect of full consciousness of the intact organism which is related to the outer environment. This also is no simple state, but one constantly changing with the flux of environmental stimuli and

modified by the movement of attention, so that, as Sherrington points out in his Gifford Lectures, "mind" may seem not to attach to a great proportion of the adapted responses to these stimuli.

Is it not possible that consciousness of choice is a cortical, and consciousness of necessity a subcortical, function? It is true that, so far as they go, Masserman's experiments on the hypothalamus seem to show that the hypothalamus is a purely effector organ and not one to which we can with any confidence attribute conscious functioning. There is much in the limited range and in the order of response to stimuli of the stuporous human subject that resembles the consciousness of necessity, but little trace of a consciousness of choice. With the emergence from stupor, elements of consciousness of choice are added progressively, and the range of environmental stimuli taken in and responded to increases. Perhaps the last elements to appear are those which subserve orientation in place and time, and with their return "consciousness" is again normal.

Kleitman traces the evolution from infancy to childhood of the normal diurnal sleep rhythm from the 4 to 5 hour rhythm characteristic of the newborn infant, and he believes this evolution to depend upon developing cortical activity. If it could be made under clinical conditions, it would be an interesting observation to see whether a comparable change from an infantile to an adult sleep rhythm occurs during the emergence from deep traumatic stupor to normal consciousness. If it proved so, it would support the notion of two components—cortical and subcortical—in the complex function we designate by the name of consciousness.

Jefferson concludes finally that the "focus" of unconsciousness is not located in the cerebral cortex but in the hypothalamic region, yet it may be questioned whether the available facts justify this conclusion. That a local lesion in this region is followed by unconsciousness does not rule out the possibility that an associated cutting off of afferent impulses to the cortex may play an essential part—and not necessarily impulses from the hypothalamus, for there is no anatomical evidence of the existence of a hypothalamo-cortical pathway, but, as Kleitman suggests, impulses from cranial proprioceptors. It seems highly likely, therefore, that there are yet undiscovered factors in the production of sleep, traumatic stupor, or unconsciousness from subcortical lesions or disorders of function, and the time has not come when we can lightly dismiss the cerebral cortex from an essential and dominant role in the mediation of what—with our simplifying tendencies—we are content to call consciousness—or a suspension of its functions from a correspondingly important role in unconsciousness.

ANURIA

The association of renal disorder with conditions so varied in nature as pyloric stenosis, blackwater fever, incompatible transfusions, and "crush injuries" has raised the question of a common factor in pathogenesis. Foy and his co-workers[1] make it clear that dehydration is the most constant feature in these conditions. This might come from excessive vomiting, disturbance of acid-base equilibrium, or diminution of blood volume. These factors, singly or in combination, would cause a decreased renal blood flow and impaired glomerular filtration, resulting in less urine. From this it seems that the oliguria and anuria are not due to blockage of the renal tubules with disintegration products of haemoglobin. The blockage, indeed, would appear to be the result and not the cause of anuria. This hypothesis is supported by the post-mortem findings[2] in a patient with pyloric stenosis who vomited greatly and had all the clinical manifestations of alkalosis, with tetany and uraemia. Lesions in the distal parts of the tubules were morphologically similar to those described in kidneys of patients dying from "crush injury," except for the absence of casts containing myohaemoglobin. This observation supports the view that neither anuria nor renal lesions depend on blockage of the tubules.

Bywaters and Dible[3] attribute the tubular damage to excessive concentration of the glomerular filtrate. Shaw Dunn and his colleagues,[4] on the other hand, lay stress on the reaction of the filtrate. The absence of myohaemoglobin in McLetchie's[2] case rules out this substance as a causal factor, though he rightly points out that some other substance as yet unrecognized may be the toxic agent. He suggests that tubular reabsorption must have strained the tubular epithelium and blood vessels owing to the general dehydration caused by the vomiting. With the small glomerular filtrate and the electrolyte abnormality caused by the dehydration and alkalosis wide differences in the osmotic pressures of filtrate and plasma would naturally exist, and damage of the thin membranes lining tubules and blood vessels might result. There is some evidence that chloride deficiency may itself lead to defective renal function. Perhaps more important is the defective blood supply to the tubules because of dehydration. The fact that the urine in McLetchie's case was acid in spite of the high degree of alkalosis shows how severe the dehydration was. Vomiting causes loss of fluid which contains sodium as well as chlorine, and the latter element is in excess in the gastric juice. To begin with, therefore, carbonic acid is retained in the plasma and tissue fluids to satisfy the demands of the sodium deprived of its chlorine partner. So an alkaline urine is excreted; but with the continued excretion of sodium there results too great a reduction in the osmolar concentration of the body fluids.[5] Since the osmotic pressure must be protected even more than the reaction, the sodium must be conserved, even though the alkalosis gets worse. The outcome is that the urine, reduced in its sodium content, has an excess of organic acid, giving a mild acid reaction. The tubular epithelium is therefore subjected to a double strain. In the lumen the *p*H is acid, whereas the reaction of the plasma circulating in the tubular capillary is more alkaline than normal. In addition, there is the excessive strain required to maintain osmotic equilibrium with a shortage of the two important ions—sodium and chlorine.

The important therapeutic question is the use of alkali in the treatment of anuria. When blockage is caused by substances, such as acetylsulphathiazole, which are more

[1] *Trans. roy. Soc. trop. Med. Hyg.*, 1943, **36**, 197.

[2] *J. Path. Bact.*, 1943, **55**, 17.
[3] Ibid., 1942, **54**, 111.
[4] *Lancet*, 1941, **2**, 549.
[5] Morris, N., ibid., 1943, **2**, 91.

soluble in alkaline than in acid fluids, alkalis must clearly be given. In other cases, however, the important thing is to increase the depleted blood volume and the deficiency in electrolytes so as to ensure an ample supply of fluid that can be excreted. For this, nothing is better than a solution of sodium chloride with glucose, the former to replenish mineral content of plasma and the latter to promote diuresis. Only in the presence of a severe acidosis associated with chronic renal disease is alkali really necessary, and it is then best supplied in the form of lactate solution.

PITUITARY CYTOLOGY AND FUNCTION

The pigeon has several advantages for the study of pituitary cytology and its relation to secretory function. First, the period of rapid bodily growth is almost completed before there is any development of the immature gonads, so that the periods of active secretion of growth hormones and gonadotrophin are separate. Again, the sex cycle of the pigeon is accurately known, and can be divided into a resting phase, pre-ovulation and ovulation phases in the female, an incubation period, and a feeding period. The absence of pregnancy and corpora lutea renders the cycle less complex than in higher vertebrates. Thirdly, in the pigeon the importance and function of prolactin are not matters of dispute, as they are in mammals: it may be mentioned here that the secretion of prolactin and of crop milk occurs in males as well as females, as the males share the tasks of feeding the young in the early stages after hatching. These factors have been stressed in their investigations by Schooley and Riddle.[1] Without entering into detailed descriptions of the cytological appearances of the cells from the pituitary glands which they examined from a large number of pigeons killed at various times during the growth and reproductive phases, we may summarize their main conclusions as follows. In the pigeon anterior pituitary, as in mammalian pituitaries, there are two types of chromophil cells which are apparently derived from a single type of chromophobe cell. Schooley and Riddle found that the acidophil cells differentiated during the later part of embryonic life, while the basophil cells matured only during the second month after hatching. This suggests that the acidophil cells are responsible for the secretion or secretions governing the growth processes, while the basophil cells secrete gonadotrophin, which is in keeping with the cytological evidence in other species. During the phase of crop stimulation and crop milk production there is evidence of secretion from the acidophil cells. Whenever functional states indicate a secretion of hormones the cytological condition of the pituitary cells is one of light granulation. Heavy granulation of the cells does not coincide with such functional states, nor are glands in which these cells predominate found to contain large amounts of the corresponding hormones when assayed by implantation. The finding that secretion of prolactin is associated with acidophil cell activity opens up some interesting speculations. Riddle and his colleagues have always been sceptical about the existence of a distinct and separate growth hormone. They have claimed that growth may be under the control of prolactin and/or thyrotrophin, and their investigations of various growth-hormone preparations have always shown them to contain at least small quantities of one or both of these hormones. The fact that crop glands are not stimulated during the initial phase of acidophil cell activity, when the body is growing rapidly, is explained by the already known insensitivity of the immature crop gland to prolactin stimulation.

A more recent study of pituitary cytology in the pigeon by Koch[2] adds to the three types of cells discussed above a number of different cell types, without clarifying the physiological significance of the findings. The work may be criticized at the outset for the use of Bouin fixation, which is notoriously bad in the study of cytoplasm and its inclusions. The description of new cell types is a tempting hobby for the cytologist, but until such types are clearly related to physiological function they must remain of interest to cytologists alone. The multiplicity of cells described by Koch does not allow so clear a correlation with physiological function as do the descriptions of Riddle and Schooley. Koch's findings agree with those of Schooley in linking the basophil cells with gonadotrophin secretion, and also associate the acidophil cells with prolactin secretion, though here the authors differ on the cytological appearance of the cells during secretion. Koch describes two types of chromophobe cells, but does not pass any judgment on their significance or their relation to the other cells. From the figures given of the large chromophobe cells they may well be degranulated chromophil cells, since they are of the same order of size and show the same sort of vacuolated cytoplasm. The small cells called "kleinzellen" are regarded as effete cells which increase in number with the ageing of the pigeon. These are probably the same as the atrophied acidophil and basophil cells recorded by Schooley in adult females segregated for long periods after egg-laying.

[1] *Cold Spring Harbor Symposia Quant. Biol.*, 1937, **5**, 165; *Amer. J. Anat.*, 1938, **62**, 313.

[2] *Arch. Gyrák.*, 1941, **172**, 1.

DISCIFORM DEGENERATION OF THE MACULA

In 1926 Junius and Kuhnt in a sumptuous monograph established as a clear-cut entity the condition they named disciform degeneration of the macula. By stressing the appearances seen at different stages of an affection that always ends with an atrophic disk-like area at the macula, they reduced a mass of purely descriptive designations to a clinical entity with an evolutionary course. They could only indicate but not define clearly the anatomical basis of the affection, but they succeeded in making superfluous such names as senile exudative macular retinitis, senile macular degeneration, pseudo-tumour of the macula, haemorrhagic macular retinitis, and many others. Histological studies on disciform degeneration of the macula have appeared with surprising frequency, and they all agree in showing connective-tissue proliferation in the deeper layers of the retina, disturbance of the pigment epithelium, thickening with or without ruptures in the elastic membrane, and transudates between the retina and choroid, sometimes quite massive. These findings are in the main confirmed by Holm,[3] whose histological study is the basis of a critical survey of the literature, which leads him to deny the validity of the conception of disciform degeneration as a distinct clinical entity. Holm's patient showed the not infrequent association of retinitis circinata, and histologically this proved to be due to subretinal fluid and not to intraretinal changes showing fatty and hyaline degeneration, as is commonly observed. He stresses that identical fundus pictures may have different anatomical backgrounds, and argues from this that the retina and choroid have a limited range of reactions to a variety of stimuli. This is no doubt true, but we doubt whether he should argue from this against the conception of disciform degeneration as a distinct entity, even though Holm can show that various

[3] *Acta ophthal.*, Suppl. XIX, Copenhagen, 1942.

observers have wrongly regarded some cases as instances of disciform degeneration. It does not add to clear thinking to link the essentially "senile" condition of disciform degeneration of the macula with Coats's disease, which is essentially "juvenile" and not a clear pathological entity.

ARTERIAL OXYGEN AFTER PULMONARY RESECTION

The lungs of a healthy person are said to contain ten times as much aerating tissue as is necessary for minimal requirements. Little, however, is known of the effects of pulmonary resection on the oxygen saturation of the blood, and it is important that this should be carefully studied in view of the numerous operations of lobectomy and pneumonectomy now being performed. Maier and Cournand[1] have made several hundred determinations of the arterial oxygen saturation after these operations, and their conclusions are of much importance. Blood was taken from the brachial artery for the estimations, which were not made when recent administrations of drugs or of oxygen might cause inaccuracy. Seventeen cases of pneumonectomy and 21 of lobectomy were studied.

In most of the pneumonectomy patients oxygen saturation was but little impaired, and, in fact, in those with a smooth clinical course it was normal within two or three days. In two cases prolonged oxygen unsaturation was observed. In the first this was associated with a large pleural effusion on the side of the operation, and restoration of the mediastinum to the mid-line by aspiration of fluid resulted in a rapid return of the arterial oxygen saturation to normal. The findings in the second case were most significant. The patient was a 62-year-old man with emphysema of both lungs who underwent left pneumonectomy for a carcinoma. The operation was well borne, but the arterial oxygen level continued to drop gradually during the next three weeks. Investigation of the pulmonary function showed that the residual air volume had reached the very high value of 70% of the total lung volume. This was due to overdistension of the remaining lung, which had ballooned over so much to the pneumonectomy side that ventilation was impaired. As soon as this was corrected by air refills on the operated side the oxygen saturation rapidly improved. This most interesting observation supports Lester and Cournand's[2] finding that pulmonary function after pneumonectomy was much better in those patients in whom marked compensatory emphysema did not occur.

The disturbance of oxygen saturation is greater and returns to normal more slowly after lobectomy than in uncomplicated pneumonectomy. Most cases show anoxic anoxaemia for a week at least, and when expansion of the remaining lobe is slow, or when there is compression from fluid, oxygenation is interfered with for longer. Retention of bronchial secretion and atelectasis may lead to severe anoxia. The remaining lobe appears to act as a shunt for some time, and even when it is aerating satisfactorily oxygen absorption from it is deficient. These findings are in conformity with ordinary clinical experience after lobectomy. Nevertheless, Maier and Cournand stress that clinical criteria of anoxia are unreliable, as is repeatedly shown by determinations of arterial oxygen. Dyspnoea and cyanosis are not accurate signs, for severe anoxia may exist in their absence. The importance of other signs and symptoms of oxygen lack, such as those seen at high altitudes (e.g., restlessness, mental confusion, and hallucinations), is often overlooked, and the authors suggest that, instead of waiting for anoxia to develop, determinations of arterial saturation should be a routine after pulmonary resection so that the condition may be recognized in its earliest stages. In any case it is clear that, after both pneumonectomy and lobectomy, oxygen therapy is often desirable for much longer than is commonly thought. After pneumonectomy correction of mediastinal displacement to either side is important.

[1] *Surgery*, 1943, **13**, 199.
[2] *J. thorac. Surg.*, 1942, **11** 529.

OPIUM TRAFFIC IN THE FAR EAST

A recent written reply by the Secretary of State for the Colonies has reopened questions which occasioned fierce debates at the second Geneva Conference on Opium in 1925. It will be remembered that the American and Chinese delegations withdrew from the Conference mainly on the grounds that opium-smoking in the Far East had not been suppressed or restricted in the way prescribed by the Hague Opium Convention of 1912, and because the production of opium was not to be limited to what was required for medical and scientific purposes. The policy now announced on behalf of the British Government is the prohibition of opium-smoking in the British territories now in enemy occupation in the Far East and the abolition of opium monopolies therein when they are reoccupied, and also that the limitation of production of opium be considered. The principles for which the American delegates contended in 1925 were: "(1) That if the purposes of the Hague Opium Convention are to be achieved according to its spirit and true intent it must be recognized that the use of opium products for other than medicinal and scientific purposes is an abuse and not legitimate, and (2) that in order to prevent the use of these drugs it is necessary to exercise the control of the production of raw opium in such a manner that there will be no surplus available for non-medicinal and non-scientific purposes." The chief opposition to these principles came from India because of the opium purveyed by the Government for eating or for export trade. Moreover, income was derived from opium monopolies in the Malay States, Straits Settlements, and Borneo which the Crown Colonies were loath to surrender. M. Zahle, the able president of the Geneva Conference, in his final speech said: "No voice, I believe, can be raised against the justice of the principles enunciated by the American delegation"; and observed: "The producing countries realize that in total they are providing far more drugs than the world needs."

The world production of opium has been estimated at not less than 2,500 tons a year, while the world requirement for legitimate medical purposes is probably less than a tenth of that amount. The principle of limitation of opium production to medical and scientific purposes has been accepted by both the Advisory Committee of the League of Nations on Traffic in Opium and also by the Assembly of the League. The British delegates to the Hague Opium Conference of 1912 were instructed when attaching their signatures to it to add a declaration that the convention, if ratified by His Britannic Majesty's Government, shall apply to British India, Ceylon, the Straits Settlements, and Hong Kong in the same way as applied to the United Kingdom. In Great Britain the Dangerous Drugs Acts of 1920 and 1923 were introduced to give effect to the Opium Convention signed at The Hague on Jan. 23, 1912, and "to bring under control throughout the world the traffic in opium and cocaine and the preparations derived from them, and to restrict their use to medical and other legitimate purposes." It is to be hoped that the new declaration of policy may tend, if tardily, to achieve this beneficent object.

THE CHRONIC MEDICAL CASE IN THE ARMY

BY

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Types of Cases and their Treatment

Of 500 consecutive chronic cases which I recently saw in the out-patient department of a military hospital there were 146 with frank psychoneurosis, 95 in which the complaint was chiefly of dyspepsia, 60 with some kind of "rheumatism," and 101 with bronchitis. 40 men had neither apparent disease nor appreciable symptoms, and had mostly been referred because of the accidental discovery of some such benign phenomenon as a systolic murmur. Of the remaining 58 cases, 6 had migraine, 5 pulmonary tuberculosis, 4 asthma, 4 syncopal attacks, 4 epilepsy, 4 the sequelae of concussion, and 3 the sequelae of meningitis. There were not more than two examples of any other condition.

Of the 146 psychoneurotics, the main manifestation of 90 was the "effort syndrome." Of the 95 dyspeptics, 19 had radiologically demonstrated peptic ulcers, 17 of which were duodenal, one pyloric, and one jejunal following gastro-enterostomy. Many of the radiologically normal cases had marked neurotic traits. Of the 60 cases of "rheumatism," the symptoms of the majority were wholly or partly psychogenic. The 101 bronchitics were the most "organic" group of all, and many of them had demonstrable chest disease. However, the conclusion that I often reached was that a man's chest was no worse than that of thousands of his fellows, and the real reason which had brought him to the out-patient department was his associated psychogenic symptoms.

Such cases as these are sometimes admitted to hospital for investigation and treatment, and they may remain for a long period. It is not uncommon to see men who have previously spent many months in one or more hospitals. Although hospital treatment may cause a temporary relief of symptoms, I have yet to hear of a single soldier with one of these chronic complaints whom it permanently benefited, except those with such conditions as peptic ulcer, for which they were discharged from the Service. If any actual medical condition is unimproved by a stay in hospital it can hardly be doubted that the psychological state is sometimes made worse by it. The men may become bored, depressed, and hypochondriacal, since they tend to think that as they are being kept in hospital they must be very ill. Their presence in a ward, too, would seem to have a bad effect on the more acute and recoverable cases there.

The conclusions from these considerations are, then, first, that the main trouble in many soldiers suffering from what are usually considered chronic medical complaints is psychiatric; and, secondly, that, whatever be the nature of their disease, they should rarely, if ever, be admitted to hospital, except in a few cases, merely to await discharge from the Service.

Disability and Diagnosis

When a man's condition is being considered by specialists or medical boards it is the usual practice to expend much effort in deciding whether or not he has organic disease. If his symptoms are thought to be psychogenic a soldier is often reported as having "nothing the matter" or that "he only thinks he is ill." This attitude of minimizing the psychological condition is curious, for it seems obvious that among the qualities which are of quite supreme importance to the fighting man are the psychological ones. Of such qualities, those which are involved in a man's efficiency as a soldier may be roughly divided into three—his intelligence, his knowledge, and his character. The quality a deficiency in which will result in the greatest military disability is character, and most men with neurosis manifestly do have a gross character defect. If, on the other hand, organic disease is found to be present in a soldier he may be lowered in category or discharged from the Service even when his actual disability is slight. Among chronic medical cases the commonest examples of this are probably recovered pleural effusion, healed pulmonary tuberculosis, hyperpiesia, persistent albuminuria which is thought to be due to chronic nephritis, and the presence of a heart murmur deemed to be organic. There should here be only one reason for lowering the category—that although the man in question has little disability now, he is likely to develop disability in the near future. In the conditions I have mentioned it would not as a matter of fact be probable—indeed, it would be quite unlikely—that such men would soon become disabled, and therefore they should not be put into a category lower than their actual disability warrants.

Another reason which is put forward against retaining such men is that, small as the chance of their breaking down may be, it is more likely to happen in the Army than it would be in civilian life. Even if this be true, when one considers that the Army is in being to fight a war in which thousands of its members will be killed or maimed this argument seems to show the lack of a sense of proportion.

Organic diagnosis thus seems commonly to occupy too prominent a place in the consideration of the chronic case, to the exclusion of disability, which is what really matters. The principle which should lie behind diagnosis is merely the decision whether progressive or severely recurrent diseases are present. If they are not, the subtleties and refinements of diagnosis can be forgotten. It follows that any investigation which does not help to make that decision is superfluous. A good example of such an investigation is the gastric analysis which merely provides an opportunity of labelling a man with an absurd diagnosis like "hyperchlorhydria." Many psychoneurotics undergo investigations directed to the stomach, heart, bladder, or other organ the function of which has been upset by the psychological disorder. In such cases it seems that the doctor has failed to look at the man as a whole but has concentrated his attention on some small part of the body.

Most chronic cases really need either no investigation at all or just one. A few need two and very few more than two. Provided that there is co-operation between the clinician and the radiologist and pathologist, it is possible to do all these with a maximum period of one night in hospital. I therefore suggest that no chronic medical case should be admitted to hospital for investigation. I previously concluded that virtually none should be admitted for treatment.

Disposal

The soldier with a chronic complaint may be so obviously unsuitable for fighting that he is discharged or lowered in category, though the official reason for doing this is often the presence of some physical condition and not the psychological defect which is so frequently the main cause of his disability. Many of the bad cases are retained in the Army and given such unmilitary duties as cleaning billets, emptying latrines, and picking up paper. When the question of actually discharging men for psychological disorder comes under consideration by a medical board, the members of the board often feel very strongly that it is unfair and unjust that they should be allowed to escape from the dangers and discomfort of a soldier's life. Although such men are usually quite useless to the Army, it does seem very wrong that they should be sent back to their homes with the halo of being poor invalids.

The actual assessment of the degree of military disability is not a medical problem at all. A soldier's officers are in a far better position to judge it than is, say, the medical specialist, who only has time to see him for 10 or 20 minutes in the middle of a busy afternoon. The officers constantly observe the man on exercises and see whether, for example, he can go over an assault course or march 30 miles or shoot to hit. The specialist, on the other hand, has to deduce from the man's condition what he thinks he ought to be able to do. This may at times bring him to quite wrong conclusions, and perhaps to say that a man is fit to carry out all the duties of an A1 soldier when he has actually never succeeded in doing so. The following scheme would, I think, supply a better method for the classification of soldiers than does the present one.

After recruits have been in the Army long enough for those in charge of them to form a proper estimation of their capabilities, those who are in any way unsatisfactory should be put to various tests. For example, it might be determined how far they are able to march in full kit, in what time they are able to run, say, a mile, how accurate they are with a rifle and other weapons, and so on. As is already done, they should also, of course, be given an intelligence test. Every man unable to attain the top grade should be

seen by the M.O., who would supply a certificate stating whether or not he has a progressive or severely recurrent condition. If such conditions are suspected the man should be referred to the specialist. All men not so afflicted, whatever they happen to be suffering from, would then be graded into various lower categories, purely according to their abilities to function as soldiers.

If an officer later on considers that one of his men is unsuitable for his existing category he should again be put through these various tests and an appropriate form filled in. In this case there might be also added a statement as to the number of times he has been in hospital or excused duty during a specific period, whether he is offensive to others (as in enuresis and chronic bronchitis), and an estimation of his character, which the officer should be in an ideal position to judge.

Any man who functioned so badly that it appeared doubtful whether he could be of any value to the Army at all would be seen by a disposal authority. This body would decide whether or not there was any place in the Army which he could fill. If there were none, he would return to civil life. If, later, the needs of the Army were to change he could be recalled. This kind of procedure is already being adopted in the case of permanent Category C men under a recent A.C.I.

The only men who could not be dealt with by this machinery are those suffering from conditions which are rapidly progressive or recurrent. They would form the proper material for a medical board, since the assessment of their likely rate of progression or recurrence is a truly medical problem.

This scheme I have outlined would evidently mean a great saving in medical man-power. If it were in operation the physician would not spend his time in fruitless endeavour dealing with the chronic sick. He would instead be able to spend his days in what should be his proper function—caring for acutely ill men and returning them to their units as soon as possible as fit and fighting soldiers.

Conclusions

Chronic medical cases should never be admitted to military hospitals for investigation and rarely for treatment.

The main disability of most chronic "medical" patients is psychological, whatever diagnosis is attached to them.

Psychological disorders cause more serious military disability than do most of the chronic organic diseases seen in soldiers.

A man should be put permanently into a lower category than his disability would warrant only if he has a rapidly progressive condition or a recurrent condition which is likely to be sometimes severe.

Disability should not be assessed by specialists or medical boards. All men, except those with progressive or severely recurrent conditions, should be classified by the results of tests designed to show how they function as soldiers.

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All German men and women in certain age groups hitherto not employed on national service have been called on to report for duty (*Reichsgesundheitsblatt*, 1943, **21**, 351). A large number of these persons, especially women, will thus be entering into a contract of service for the first time. The Labour Controller has issued the following order, which is based on the order of the Reich Health Leader: "The chief medical officer of the Labour Office in each State makes immediate contact with the competent medical chamber. If the necessity should arise, the competent medical chamber can undertake the examination of the medical reports if a local agreement to this effect has been arranged between the chief mdical officer of the State Labour Office and the competent medical chamber. . . . It is absolutely essential that no error should occur in allocating women to work which might reduce their fertility. . . . The doctors primarily concerned with this problem are doctors who have placed themselves at the disposal of the centres for childlessness in marriage, the doctors in charge of State and municipal gynaecology and midwifery training centres, etc. Attention is drawn to the fact that even with the most careful investigation of legitimate complaints the present circumstances demand harshness in the employment of women. Also the earlier experiences of the RADWI [Young Women's Branch of the Labour Service] showed that permanent damage is hardly to be expected from amenorrhoea resulting from employment. It is therefore neither a reason for exemption nor an excuse for release from employment. . . . I am convinced that the German doctor also in this new sphere of employment will prove himself as hitherto a political protagonist who serves Fuehrer and people with a sense of responsibility and in this way helps to achieve total victory."

A CLINIC IN THE BUSH

[FROM A CORRESPONDENT]

It all began from laundry baskets. Matron complained that the baskets for clean and dirty linen, which the "mammies" carried on their heads, were too small and that too much time was wasted carrying the laundry backwards and forwards. The markets and the shops of the capital yielded no baskets—or anything else of much use, for that matter—so it was necessary to find someone to make them.

Passing through a large bush village on one occasion, trying to buy eggs to relieve the monotony of beans and bacon or soya slips for breakfast, I asked a "boy" who could speak a little English if there was anyone in the village who could make baskets. "Oh yes, mastah, my father he make fine fine baskets plenty." So I was taken into a compound, and, threading through narrow paths between huts, from which innumerable children ran out, past the women and girls grinding the Koos in large wooden mortars with pestles nearly as big as themselves, I arrived at a very dark hut, inside which a venerable but dirty-looking old man in a ragged shirt sat weaving a mat, with a selection of wives round about, from a buxom damsel of 17, well on the way towards her first-born, to wizened women of 40 or 50, and children from babies in arms to grown-up men like my guide.

The old gentleman spoke no English, but after "plenty palaver" he agreed to make enormous baskets at four shillings a time. Very fine baskets they were too, well worth the money and exactly what was wanted for the laundry. He made about four or five a fortnight and we wanted eighteen. In the middle of making them "he went for bush to buy a cow," so his wives informed me, and this transaction took him about three weeks. All in all, then, my dealings with the old gentleman lasted for a considerable time, but before long the purchase of baskets took a very minor place in my business in this village.

It was on one of my early visits to take delivery of the baskets that the son, my interpreter, drew my attention to his bandaged leg, and asked me for "white man's medicine," as with this bad leg he could not work. I confess that at my next visit I had forgotten all about his leg and had brought no remedies, but his silent reproach that the "great white master" had failed him was such that I could not forget again.

He had a typical tropical ulcer, which seemed to be based on a yaws sore, for he had signs of previous yaws on his feet—fissures and punched-out scars. So the next time I brought a supply of succinyl sulphathiazole powder, a syringe, and a flask of sobita. His treatment was very satisfactory, but even when quite cured he did not return to work, though he often demanded a "paper" of recommendation for a job. Actually he remained my faithful doorkeeper and almoner at the clinic until I left the colony. On my next visit eight or ten adults and children with bad sores on their legs presented themselves. They were given "chucks" (injections) and their sores were bandaged up with powder.

The effect was magical—not so much the treatment as the way the news spread. Soon what had begun as a benevolent gesture became a serious moral obligation not only for that village but for all the villages round, whose sick walked quite long distances to get treatment; what at first took three minutes soon became three and a half hours of really hard work. Every Saturday afternoon I spent the time with the villagers, until I was sweating and exhausted, and my medicaments, which had to be increased in quantity weekly, were finished.

One week when I was sick a colleague took my place, "just to see what it was like." He saw all right, but, like me, felt that we could not go back on this self-imposed task, and at the end of my stay in the colony we both went and worked all out for the whole of the afternoon. There is no doubt that the villagers were grateful, and sometimes they tried to express their thanks, and although their efforts were clumsy they were none the less sincere. Our missionary zeal, however, was not without ulterior motive, for we let it be understood that "susikilo" (eggs) and other produce were not unacceptable. For six months we never lacked an egg, sometimes two, for breakfast, and had enough over to give some to our friends. An occasional chicken, in season mangoes, oranges, and pawpaws, more than we could eat, made a lot of difference to the meagre and monotonous diet provided by the supply authorities, who had not the graft of medical skill enjoyed by us.

Crowded "Out-patients"

Our "consulting room" was primitive in the extreme. At first we held our sessions outside a hut, with no table or chair, partially protected from sun and later from rain by the edge of the thatched roof, with literally dozens if not hundreds of men, women, and children crowding round, laughing, talking, gesticulating, so that it was well-nigh impossible to hear oneself speak or to move one's arms. As the numbers grew and the rains came on in earnest this

arrangement became impossible; we had to be protected from both our patients and the weather. We brought a table and a couple of chairs and were allowed the use of a slightly larger and more stable hut, *pro bono publico*. Here we sat in a dark and stuffy inner room while half a dozen stout bodyguards held the seething multitude at bay. They were fairly successful with the men, but with the women and children, who were kept waiting until the men had been attended to, all bounds were soon broken, and we were almost submerged by a mass of solid, black, but clean flesh, even though they were covered with yaws ulcers.

The domestic habits of these people are filthy in the extreme, but in their persons they are far cleaner than those whom one is accustomed to see in a hospital out-patient department at home. This cleanliness was what really made the clinic possible, and accounted for the absence of calamities from our very unorthodox treatment. Latterly we were giving 150 to 200 intramuscular injections every session; there was no time for asepsis, and the only cleaning a needle got was passage through the skin of the next patient; yet we never had an abscess or even a septic pimple. This cleanliness was not due either to an absence of clothing, for it was wonderful how many layers of cloth were unwound, especially from the women, even in that tropical climate. They always wanted to appear pregnant, as that was their most honourable condition, and if they were not they bunched up the innumerable layers of cloth in which they were wrapped in order to add verisimilitude to an otherwise unconvincing shape. Modesty was curious; after the first moment of confusion the grown-up women and older girls showed none, though the little girls from about 5 to 10 were much more diffident. The men were very shy, especially if they thought that their women were looking at them over the fence, while some of the old men were as coy as any delicately nurtured English maiden.

Our teachers of medicine would have been horrified at our rough-and-ready methods, and the traditional sixpenny practice with hands up for cough or belly-ache would almost appear scientific in contrast. Still, on the whole it worked, and anyway it was the only form of treatment these people had a chance to get. It certainly taught us about the diseases indigenous in that part of the Tropics in a way which no set lectures and demonstrations in an organized course could have done.

Prevalence of Yaws

By far the commonest disease we were called upon to treat was yaws. It must affect nearly 100% of the children. Generally it was in the secondary stage, with the characteristic ulcers with heaped-up edges, which, with secondary infection, often spread widely and deeply as tropical ulcers. These yaws are chiefly on the feet and legs, but also on the extensor surfaces of the elbows, and, especially in women and children, over the sacrum and buttocks and in the natal folds. It was quite remarkable how these yielded to half a dozen weekly injections of 1 c.cm. of sobita. Of course it was impossible to do Kahn tests and we probably did not cure the disease, but at least we removed the symptoms for a time. Sometimes the sores were so thick all over the body that there was scarcely room to make the injection, but even these melted away under the influence of the sobita, and the tropical ulcers, once the secondary infection was checked by the succinyl sulphathiazole powder, closed up with astonishing rapidity in many cases. In fact this became a therapeutic test of the nature of the ulcer. In nursing mothers a severe mastitis was often seen, which cleared up equally satisfactorily with sobita.

Other manifestations of yaws were swollen, intensely painful joints, periarticular nodes, and in older people the aching pains in the shafts of the bones and headache, which was a marked symptom. These pains were generally easily diagnosed by the concomitance of fissured feet, and the patients always expressed themselves better as the result of the sobita.

Fibrositis existed, but was not often seen, except where there was a clear history of severe strain or other trauma. Gonorrhoeal arthritis was not very uncommon, but arthritis of the rheumatoid or osteo-arthritic variety was very rare, although it did occur. The phalangeal deformities of very late yaws were not dissimilar to a chronic rheumatoid hand. Acute rheumatic infection was supposed to be non-existent, but two young women with undoubted mitral stenosis were picked up in another clinic.

The most interesting disease was trypanosomiasis, which was not supposed to exist in that part of the colony. Although not common, there was seldom a week when we did not discover one or more children or young adults with dull, mask-like, almost Parkinsonian features, functional ptosis, and enlarged glands, especially in the posterior cervical triangle, complaining of headache, lassitude, and fever, and sometimes of sleepiness, though this latter is a late symptom as a rule. We tried to get them to come up for gland puncture and confirmation to the hospital, where the subsequent antrypol and tryparsamide medication could be given intravenously, as we did not dare to give intravenous injections under the septic conditions of our clinic. One of the most interesting cases was that of a small boy who had all the appearances and behaviour of a low-grade imbecile, but who also had trypanosomiasis. Under treatment he developed in a most remarkable way, and, although probably still backward, was raised far above the imbecile class. It was impossible to test the degree of deficiency with no basis of common speech, for we had Mandingos, Jollofs, and a few Fullahs, all speaking quite different languages.

Incidence of Other Diseases

Skin diseases were common—scabies, tinea, and some conditions which defeated our powers (admittedly limited) of dermatological diagnosis. Leprosy was rare, but we did see one or two cases. Elephantiasis was also rare, but a few cases turned up, often confined to one foot or leg and not often in the scrotum. Oedema was not uncommon, mostly of hepatic origin; malaria, amoebiasis, and other tropical maladies did not give the liver much chance of remaining healthy. Dysentery was for the most part mild, and as sodium sulphate was equally efficacious for this and for constipation our therapeutic resources, necessarily very limited, were in this respect economized.

A large proportion of children between 2 and 12 had enlarged malarial spleens, but after this age splenomegaly tended to disappear and malarial attacks, though they did occur, passed almost unnoticed, they were so mild. It was interesting to note that the almost universal pot-belly in the young children was scarcely ever due to an enlarged spleen, as we at first suspected, for the spleens were not large enough to cause so much distension. Umbilical hernia was very common, probably due to the crude methods of separating the cord, and consequently the abdominal muscles were at first very lax, until head-carrying of weights, begun at a very early age, strengthened all the muscles of the trunk; in children who were breast-fed for two or three years some of the distension was just plain fat.

Chest conditions were often seen: a few cases of tuberculosis, which went downhill very fast; many cases of not very severe bronchitis; and a few patients with pneumonia, most of whom recovered quickly, generally walking about on the fourth or fifth day and sometimes not lying up at all. Heart disease was represented by a few congenital abnormalities and one or two final breakdowns, but except for the two cases of mitral stenosis already mentioned and an occasional aortic incompetence, presumably syphilitic, there was none of the wealth of clinical material so often met with in out-patient departments at home.

Organic nervous disease was practically non-existent, because there is little nervous syphilis and yaws does not attack the nervous system, but we had one pathetic old gentleman with paralysis agitans, who was convinced that an injection of sobita would cure him at once. Mental disease was represented by very occasional cases of schizophrenia. Juju hysteria is not met with to any extent in the colony. Venereal diseases were not very common in the villages and were chiefly gonorrhoea and lymphogranuloma; the glands in the latter disease sometimes blocked the lymphatics, causing unilateral oedema; these cases we referred to a V.D. clinic which we held in another village. Syphilis was difficult to diagnose. This is not the place to discuss whether yaws is really syphilis or syphilis yaws, but syphilitic lesions such as we are accustomed to at home were not met with to any extent. Gonorrhoeal (?) ophthalmia was not uncommonly seen. It was so severe in some cases as to make treatment appear useless, but 10% protargol seemed to help even these apparently hopeless people so much that from being quite blind they were obviously able to see. It must be remembered that they do not read or do any fine work, so even a small degree of vision was reasonably adequate. The same treatment was successful in trachoma, which is often found here, although it is very mild, with remarkably little disabling effect.

Otitis media was rare in spite of the prevalence of upper respiratory catarrh, and we saw no mastoiditis or other severe aural complications. Septic teeth and tonsils were not often seen, but when they did occur, or rather when the people were led to complain about them, they were bad, and some of the dental abscesses were appalling.

This bush clinic was really a commonplace out-patient department, with the common and interesting diseases characteristic of a tropical instead of a temperate climate; but it was instructive, as all such out-patient departments must be. Our diagnosis and treatment were severely limited by the total absence of modern facilities and ancillary services, but on the other hand perhaps it was good for us to realize that clinical medicine could still do something without them. The chief lesson to learn, however, was that from the humanitarian point of view we have a duty as a profession to bring some relief and healing to these simple, kindly, and trustful people. From the scientific point of view, what a wealth of untapped material at all stages of disease is to be found ready to our hands, especially if we go out to the people, instead of sitting still and waiting for the people to come to us, often when they are beyond relief.

Correspondence

The Changing Character of War Wounds

SIR,—A recent tendency has been noticeable on the part of those recording experiences of war wounds to ignore a factor which would appear to influence results of treatment, and may, unless due consideration is given to past wars in the light of the present one, easily be overlooked. The more favourable results of the treatment of wounds in this war when compared with those of 1914–18 are generally ascribed to such factors as earlier excision, the sulphonamides and now penicillin, tetanus toxoid, early plaster fixation, special mobile surgical teams, etc. All of these are obviously highly contributory, but there are still others which may be operative. Among these the environment in which wounding occurs is no doubt important, and we should not lose sight of the character of the wounds themselves. For the most part the present war wounds are found to be singularly free from pieces of uniform, underclothing, webbing and leather equipment, badges, and the like, which were so frequently seen in the last war and were such a heavy source of contamination. Inquiry into the reason for this difference in the character of the wounds at once suggests that this is due to the difference in nature of the explosives and the missiles used.

When Lord Nelson was mortally wounded by a musket ball which, striking his left epaulette from above, fractured the spine, traversed the spinal canal, and lodged in the muscles of the back, the ball carried in with it "a portion of the gold lace and pad of the epaulette, together with a small piece of his lordship's coat" (Richard Clarke's *Life of Nelson*, London, 1813). These materials were found firmly attached to the ball as it lay embedded in the muscles. From Trafalgar until the 1880's there was little fundamental change in small-arm ballistics, but about that time high-velocity rifles were first used. These burned "smokeless" powder and fired small and hard projectiles at high velocity which tended to cut through, rather than punch out and carry pieces of clothing or other covering material along with them. With their use and later still high-explosive shells, deep contamination by clothing or other materials traversed by missiles took place less often, but nevertheless did not disappear entirely, as was amply shown during the years 1914–18. The projectiles used in the present war, however, are remarkable for the still higher velocities imparted to them—velocities which have never hitherto been attained and are probably in some cases of the order of 8,000 or more feet per second. At the same time the materials of which these missiles are composed are for the most part relatively light as compared with lead. The result is that many war wounds to-day are caused by small fragments of relatively light material travelling at an extremely high velocity. These cut cleanly through whatever coverings they meet, and in doing so undergo rapid change in momentum so that they relatively soon come to rest. Their wound of entry may be difficult to find, and as they are very hot they are relatively sterile and often do little damage.

I suggest, therefore, that in any comparison of the results of treatment of the casualties of this war with those of the last the changed character of the wounds caused by modern projectiles should be given due consideration.—I am, etc.,

Bristol. LAMBERT ROGERS.

Thymectomy for Myasthenia Gravis

SIR,—The report by Dr. Maurice Nellen on a single example of thymectomy for myasthenia gravis (Dec. 18, p. 778) is of much interest as additional evidence that remission of symptoms may follow the operation. It may be questioned, however, whether it is really wise to publish isolated instances of treatment in a disease where so many unknown and doubtful factors are concerned as are found in the clinical complex known as myasthenia gravis. It is certainly unwise, I think, to conclude, as Dr. Nellen has done, that there is enough evidence now "to warrant a thymectomy in every case of myasthenia gravis." In collaboration with Dr. James Carson I have, since Feb., 1942, performed the operation of total thymectomy twenty-five times, and a brief report of the first twelve was given at a meeting of the Neurological Section of the Royal Society of Medicine in Nov., 1942. This comparatively large series of operations will, we hope, ultimately form the basis for a detailed account of the surgery of the thymus gland and its relation to myasthenia gravis. The results, however, are very erratic, so that it would be equally misleading to publish either a single failure or a single success. We feel that we are still treading on uncertain ground, and although we are encouraged to proceed cautiously with careful choice of subjects, we are far from subscribing to Dr. Nellen's conclusion that a thymectomy should be done for every patient with myasthenia gravis.—I am, etc.,

London, W.1. GEOFFREY KEYNES.

The Abduction Splint

SIR,—No doubt Mr. Souttar in his most interesting Bradshaw lecture "Physics and the Surgeon" expected some criticism of his remark about the "so-called abduction splint." One cannot resist parrying his slight sword-thrust, for it is so obviously misdirected. The primary purpose of the abduction splint—used, for example, in the treatment of tuberculous hips—is not to produce abduction but is to control the hip and to give immobilization. This immobilization and control involves careful attention to both lower extremities and to the pelvis, and the splint does in fact maintain the hip-joints in whatever position the orthopaedic surgeon determines to be best for the particular joint in question. The abduction splint and the patient form one complete mechanical system, traction and counter-traction being arranged with scrupulous accuracy for the purpose mentioned.

Mr. Souttar need not lower his voice when criticizing orthopaedic surgeons: we welcome criticism.—I am, etc.,

Exeter. NORMAN CAPENER.

Cerebral Herniae and Surgical Decompressions

SIR,—Your reviewer of the handbook of surgery by Handfield-Jones and Porritt (Dec. 18, p. 781) disagrees with the suggestion that the term cerebral hernia should not be used for surgically made decompressions. These decompressions properly made are under cover of functioning muscles with conserved nerve supply, and are thus under a very good measure of control and differ from an unrestrained brain protrusion covered only by skin or granulation layer.

There is an essential difference here, and to call one a decompression and the other a hernia is worth while. The maker of a good decompression is saved from the stigma of being the creator of a real hernia, which is, or rather was, an indication of slovenly technique.—I am, etc.,

London, W.1. A. DICKSON WRIGHT.

Omens of Influenza

SIR,—Commenting on your leading article on influenza (Dec. 4, p. 717), where you say, "the phenomena which determine epidemic influenza are still largely unknown." Dr. A. Garvie suggests that epidemics may often follow outbreaks of common colds (Dec. 18, p. 793).

May I suggest that a more useful alternative would be to attempt to predict epidemics by some combination of the two main theories: the seasonal (i.e., meteorological) and the intrinsic cyclical one of Brownlee in its two-phase modification (Webster, *Edinb. med. J.*, 1939, **46**, 591). Thus the last peak over 300 was in the week ending Feb. 15, 1941. Should the present peak have been reached at 1,148 (week ending Dec. 11) the interval is 4½ periods of 33 weeks; the half-period being 15 weeks, as often is the case in both influenza and cancer.

It is also of interest that the present epidemic is seven years (to a month) from the 1937 January peak, and 11 years from the 1933 epidemic. Influenza here seems to show a similar "long-period" to that discussed recently by me in cancer (Dec. 4, p. 720).

Swine influenza breaks out in such widespread areas of the United States simultaneously that only a meteorological "trigger" can be suggested as an essential causal factor. A similar correlation in human influenza is suggested by study of the meteorological phases at large epidemics, as in the marked "polar front" shown in chart form by Sir Napier Shaw

in his *Drama of Weather* (1933, Fig. 72, p. 196) for Feb., 1929. Epidemics are more likely to occur when such a meteorological environment, with its associated biochemical reactions, and other lowered resistance factors coincide with one of the periods (or half-periods) on the cyclical theory of Brownlee-Webster. The present epidemic in its time of arrival supports such a viewpoint.—I am, etc.,

London, W.1. J. H. DOUGLAS WEBSTER.

Secondary Organisms in the Lungs in Influenza

SIR,—Your leading article on staphylococcal pneumonia (Dec. 18, p. 783) is evidence of a renewed interest in the secondary invaders of the lungs in influenza, and especially in the very dangerous *Staphylococcus aureus*, which one or two of us found in 1918–19. You quote from a short paper of mine in the *Lancet*, but this was a preliminary note on what we were then finding in Malta. I really write this to say that a somewhat fuller account, with records of a larger number of cases, was published in the *Journal of the Royal Army Medical Corps* for Feb., 1923. One striking comparison showed that while *Staph. aureus* was present in the sputum in 27% of 187 cases of bronchopneumonia, it was found in 83% of 30 fatal cases. Perhaps I might quote from the conclusions of this paper:

"The results obtained give no clue to the nature of the primary infection, but they show to what an extent this primary infection reduces the resistance of the tissues to the attack of the secondary invaders. The occurrence of *Staph. aureus* in a large proportion of fatal cases [in Malta] has not, I think, been recorded as a feature of the epidemic in other places. . . . It is evident from the numerous published accounts that the secondary organisms found in the lungs vary in different localities, and difference in case death rates may be due to difference in the secondary invaders."

—I am, etc.,

Dundee. ADAM PATRICK.

A Diagnostic Sign in Catarrhal Jaundice

SIR,—In connexion with your leading article of Nov. 27 (p. 680) on epidemic hepatitis and the interest being shown in the subject, there are, as you say, many unsolved problems. One great help in solving these would be some clinical means of distinguishing this type of hepatitis from ordinary catarrhal jaundice before the occurrence of many cases makes the diagnosis plain, and also, if possible, some way of recognizing mild and abortive cases. So far serological tests have not been helpful and they always take time. I think there is definite diagnostic value in two points which I have not seen mentioned in the literature, but which have been observed in most of my patients, as also in those of my partner, Dr. Mary MacLaren. The first is the type of vomiting. This comes on suddenly, very frequently at night, and with so little warning that the gastric contents are frequently vomited on to the bedclothes, even in adult cases. This suggests that it is central rather than gastric in origin, and it usually occurs a few days before the jaundice. The latter, as has been noted, often affects the skin before the conjunctivae, and in an early or mild case it shows best on the nape of the neck; in fact the neck looks at first as if it had not been washed, and the jaundice may spread no further. This is, I think, very typical.

A sign which is more definite than these two symptoms is the curious Ligat's reflex to which I drew attention in a letter in the *Journal* in 1938 (Sept. 24, p. 683). Briefly the sign is the presence of Ligat's reflex (hyperaesthesia to light pinching of the skin) in the appendix area and also in a definite narrow line about the position of a paramedian incision, to the left of the midline and commencing at the level of the umbilicus. A small epidemic here this year enabled me to test its diagnostic value. I was called on Jan. 8 to see a boy aged 6 for an attack of sickness. On examination I found Ligat's reflex very active over the appendix and also in the paramedian line I have described. I told his mother that the lad would develop jaundice—of which he then showed no trace, nor did I know of any cases in the district—and that probably his two elder brothers would do the same. He duly developed jaundice on Jan. 11, and had a moderately mild attack. On Jan. 19 one brother, aged 9, had an attack of vomiting, and both Ligat's reflexes were present, but by Jan. 26 the sickness had ceased, though the reflexes were still active. On Jan. 31 his elder brother, aged 11, went down with fever, vomiting, and very marked jaundice. This last boy had had no prodromal symptoms whatever, though he had the worst attack of the three.

Altogether I saw eleven cases of epidemic hepatitis in the next four months, mainly in the first six weeks, though I knew of others. For example, I attended a girl aged 9 during the acute phase of a moderately severe attack from April 20 to 26. On the last date her twin sister, who slept with her, showed no symptoms or signs of disease, but on May 22 she developed so mild an attack that I was not called to see her. The worst case was of a woman aged 29 who developed the jaundice on Feb. 24 after her child aged 4 had had it on Feb. 1. I saw one child of 10 on Feb. 16: she had epistaxis on Feb. 20 and 22, and jaundice developed on Feb. 22. Her younger sister, aged 8, showed both reflexes mildly on Feb. 22, but they were not present 10 days later, and she had had no gastric symptoms. Their small brother, aged 5, on Feb. 22 showed a reflex over the appendicular region, but this seemed completely gone a few days later.

Thus this small epidemic suggests that this combined appendicular and left paramedian reflex has definite diagnostic value in that it enabled me to forecast the appearance of an epidemic before any cases of actual jaundice had been seen, that several times cases were correctly diagnosed before jaundice developed, while in the few cases in which the reflex passed off without actual jaundice or even symptoms there was a strong probability that they were actually mild or symptomless infections. If further investigation should confirm the general validity of these observations, it would give us much-needed help in discovering cases and elucidating the disease. I would, however, repeat what I said in my first letter—that when dealing with children gentleness and tact are needed if the results are to be reliable.—I am, etc.

Winsford, Cheshire. W. N. LEAK.

Treatment of Sciatica

SIR,—In the article on pain in the distribution of the sciatic nerve (Dec. 18, p. 773) there is no mention of the French method of treatment. This was published some two or three years after the last war: I think in the *Practitioner*. The description was to the effect that if a patient with sciatica lies on his back, well relaxed, with the knees bent over a large firm pillow and presses firmly on a vertical bedboard with the ball of the foot of the affected side, the pain will very likely disappear. The ankle should be dorsiflexed. This method is most efficient, and, as in so many cases of nerve pain, once a few seconds of physiological as distinct from drug relief is obtained the result tends to be permanent. Presumably the explanation lies in the antagonistic innervation (Golla) relaxing the hamstring and leg muscles and so resting the nerve. This explanation was not given in the description.

Contrary to the quoted statement, I remember seeing some three much-inflamed sciatic nerves exposed to view by my late chief, Sir D'Arcy Power.—I am, etc.,

London, W.1. G. H. COLT.

Diagnosis of Spontaneous Hypoglycaemia

SIR,—I agree with Dr. R. D. Lawrence (Dec. 11, p. 760) in his view that the diagnosis of spontaneous hypoglycaemia is becoming too popular and overdone as an explanation for minor indispositions. The disease hyperinsulinism is, of course, the clinical opposite of diabetes mellitus, and frequently is curable, if not by dietary adjustments by surgical intervention. But episodes of hypoglycaemia do not necessarily mean excessive insulin. Just as hyperglycaemia is merely a symptom, so hypoglycaemia is a symptom which is encountered in a number of abnormal states other than those of pancreatic origin. The least common of these are gross disorders of the liver (hepatic atrophy provoked by poisoning and causing hypoglycaemia as a terminal event), diseases of the muscles such as progressive muscular atrophy and muscular dystrophy, and abnormalities of other glands of internal secretion such as hypofunction of the adrenal cortex in Addison's disease, hypothyroidism, and insufficient function of the anterior lobe of the pituitary gland (chromophobe tumours). Rather more common is the symptomatic hypoglycaemia occurring not infrequently as a presenting feature in the various psycho-

neuroses. This is sometimes referred to as the nervous type of hypoglycaemia, and is easily diagnosed, for the patient, besides being emotionally unstable and complaining of hunger and weakness before meals, also has other symptoms, not uncommonly those of an anxiety state. The treatment, of course, is simple reassurance and encouragement together with carbohydrate food to overcome the hunger and weakness. Another real syndrome is effort hypoglycaemia, which may arise after strenuous physical exertion. Athletes compensate for this before competitive sports by eating lump sugar.

The term hyperinsulinism should be reserved for those cases of hypoglycaemia in which an adenoma or carcinoma of the islet cells is present or for those few cases in which there is primary overactivity of non-neoplastic insular tissue.

The criteria for the diagnosis of spontaneous hypoglycaemia may be enumerated as follows: (1) a post-absorptive blood sugar (b.s.) value of less than 0.060 g. per 100 c.cm.; (2) intolerance of going long periods without food; (3) symptomatic attacks of hypoglycaemia occurring when the patient is fasting; and (4) relief of such attacks by the administration of sugar. A useful diagnostic point is the previous health of the patient. In all cases of neoplasms of the pancreas the patient enjoys normal health prior to the first hypoglycaemic attack, which usually occurs no more than a few months before the patient seeks medical advice, and subsequent attacks follow with increasing frequency. This course is not seen in the hypoglycaemia of psychoneurotics, and a b.s. in the morning after a night's fast is invariably greater than 0.070 g. per 100 c.cm., whereas in cases of true hyperinsulinism the post-absorptive b.s. value is always less than 0.060 g. per 100 c.cm. Also psychoneurotics who present with hypoglycaemia stand up well to fasting.

All patients who are suspected of true hyperinsulinism should be subjected to the "fast test," which comprises the withholding of all food for about 36 hours with the patient under supervision, preferably in hospital, and when symptoms appear a b.s. is taken and sugar administered to restore the patient's well-being. Such a test reveals all cases of true hyperinsulinism, and very low b.s. values are obtained. Psychoneurotics tolerate the test quite well, and the level of the b.s. is generally as high at the end of the 36-hour period as it was at the beginning. In hyperinsulinism, of course, the development of symptoms necessitates termination of the test many hours before the scheduled period, and the b.s. then is less than 0.050 g. per 100 c.cm.

The mere fact that symptoms are relieved by giving sugar should be interpreted with extreme caution. The level of the b.s. should be ascertained at the exact time symptoms are present, and only with this precaution can the inference be made that any symptom is at all related to the level of the b.s.

Though the medical profession is to-day more than ever "hypoglycaemic-conscious," it is as well to bear in mind some of the more common disorders with which spontaneous hypoglycaemia may be confused: peptic ulcer and functional dyspepsia (spells of fatigue plus hunger relieved by food); attacks of unconsciousness from any cause with or without convulsions; epilepsy itself; intoxication from alcohol; psychotic conditions; the psychoneuroses (hysteria and anxiety states chiefly); confusional states; and all organic diseases in which mental or nervous abnormalities occur.—I am, etc.,

GEORGE R. W. N. LUNTZ,
Medical Officer, Guy's Unit, E.M.S. Hospital.

Diet and Peptic Ulcer

SIR,—In his letter to the *Journal* of Dec. 4 (p. 725) Sir Arthur Hurst makes a statement which, because it is based on a life-time study of alimentary disorders and a wealth of clinical experience, lays it all the more open to timely criticism. He shows no sympathy for Dr. Wrathall Rowe's assertion (Nov. 13, p. 619) that meat leads to a far more abundant secretion of HCl in his (Dr. Rowe's) stomach than cheese, and goes on to state, "If it is subjective, and not the result of comparative test-meals, it is valueless"! I, on the contrary, as a fellow-sufferer can both appreciate and sympathize with Dr. Rowe's assertion.

I can well believe that acutely painful experience tells Dr. Rowe when he is secreting abundant HCl, and that he has no need to resort to comparative test-meals for confirmation. Would Sir Arthur have us believe that the secretion of HCl quantitatively, as influenced by the ingestion of different kinds of food, cannot be recognized subjectively by the medical man who, in addition to his clinical training, is also a victim of confirmed peptic ulceration? I hope not.

It is interesting to note that among his patients Sir Arthur has had several doctors who "for years had taken alkalis and belladonna for acidity, till a test-meal showed that they really had achlorhydria." I can only conclude that these doctors never had occasion to resort to vomiting in an effort to relieve their pain. Had they done so they would soon have known whether or not they were suffering from acidity. Would it not be more accurate to say, "Numerous investigations have shown that anything less than 1/100 gr. (hyoscyamine or atropine) has no *demonstrable* action on the secretory or motor activity of the stomach"?

Sir Arthur Hurst's impersonal, coldly scientific approach to the whole subject is mildly resented by both my hyperchlorhydric stomach and my duodenal ulcer.—I am, etc.,

E. MAURICE WEBSTER.

Therapeutic Fallacies

SIR,—None of the correspondents taking part in the discussion seems to have sufficiently acknowledged the main issue of the article by Linnell and Thomson. Their criticisms are on minor points, and even there the views of the authors appear to be misrepresented in many instances.

In my opinion the paper is a very courageous attempt to apply to the question of medical treatment the same strict rules as to medical diagnosis. Treatment must be built on scientific principles, developed logically, and proved experimentally; if there are forms of treatment instituted by tradition and habit only, they have to be carefully examined and sifted by the scientific method. Should they "be proved to be valueless they should be discarded" (Linnell and Thomson). Now the Vienna medical school (when such a school still existed) had men with ideas very similar to those propounded by the authors. I cannot help quoting two important witnesses for this statement.

Prof. M. Neuburger, the last medico-historian of the school, writes in his book *British Medicine and the Vienna School* (Heinemann, London, 1943, p. 55): "The therapeutic scepticism of Skoda: The high standard which was reached in physical diagnosis enabled Skoda to follow the course of diseases independently of the subjective symptoms, and he used this . . . to throw light on the value of methods of treatment used by his contemporaries. The worthlessness of many therapeutic measures in common use was thereby revealed, and so Skoda gradually reduced them to a minimum." J. Bauer, one of the younger representatives of the last Vienna school, is a disciple of Mannaberg (and thus indirectly of Nothnagel), of Obersteiner, Wagner-Jauregg, and a junior contemporary of Wenckebach, Chvostek, Ortner, and H. H. Meyer. He is now professor of clinical medicine in Los Angeles, California. In his book *Constitution and Disease* (Heinemann, London, 1942), reviewed in a leading article in the *Journal* of April 24, 1943 (p. 510), he writes in the chapter on "Principles of Treatment" (p. 186): "The physician carrying out a treatment must know as much as possible about the aetiology, pathogenesis, and consequences of a pathologic state that he is about to treat. Otherwise he deserves the title of quack rather than doctor. There cannot be any discussion about this point." Under the heading "Pitfalls and Errors" in the same chapter he criticizes the thoughtless application of vitamin therapy. He discusses at some length the errors that "occur through misjudgment of the nature and prognosis of essential hypertension, chiefly a constitutional disease." He then comments on the many pitfalls and errors occurring in endocrine therapy, his special field of study. He shows how ignorance or even incomplete knowledge, not only of the actions of different hormones but of small and large doses of the same hormone, may cause lasting harm. He concludes this chapter and his book with the following words: "We should be modest and more reluctant to interfere with the precise mechanism of the living machine without necessity. One of the most difficult tasks in medicine is *primum non nocere*!"

These sentences could have been used as motto by Linnell and Thomson for their article.—I am, etc.,

London, S.W.3. V. C. MEDVEI, M.D.Vienna, M.R.C.P.

Possible Developments in Social Medicine

SIR,—Excuse the personal note in this letter, but I wish, as one who has been interested in this subject for forty years, to thank Dr. Pemberton for his contribution (Dec. 11, p. 754); it is very encouraging. Don't let us be too timid, however, or we may fail the democracy we hope to serve. Prof. Ryle, in his admirable address, says that social medicine has nothing to do with politics, and here we tread on difficult ground. Party politics, yes; politics in the great sense of production of good citizens, no. Human values must come first every time: they are easily the "first priority."

Just one illustration of our dilemma. Plans are prepared for large ten-story flats to house families as well as other people. In other ways the plans are excellent and a great advance on pre-existing chaos, but in this one respect the human element has been subordinated to other considerations. Are we to keep silent? Mass flats will tend to produce the mass mind and stifle that tendency to variety upon which progress depends. No social worker will advocate flats for family life. It is a monstrous injustice to children, born and unborn. Some day, perhaps, social medicine will find a voice to pronounce firmly on these human affairs, and a blessed day it will be.—I am, etc.,

Letchworth. NORMAN MACFADYEN.

Wartime Appointments of Radiologists

SIR,—The president and council of the British Institute of Radiology have recently had the opportunity to ascertain the feelings and views of a large number of radiologists who are at present serving with His Majesty's Forces over-seas. These officers have, in many cases, been serving abroad for some years, and feel that they may not for some time be in a position to put forward their views or to maintain touch with those bodies by whom radiological appointments may be made during and immediately after the war. Considerable anxiety is felt by many officers that their interests may not be adequately considered, and that their position on return to civilian life may thereby suffer.

I am therefore instructed by the president and council of this Institute to bring these facts to the notice of consultative and appointing bodies for their information. The following suggestions are also put forward, and it is felt that their adoption would do much to relieve the very natural anxiety of radiologists, especially the younger radiologists, now serving over-seas.

It is suggested that: (1) No radiological appointment be made for a longer period than the duration of hostilities. (2) Appointments made during the war, whether to British or alien nationals, be, where possible, made subject to review after demobilization has taken place. (3) Such conditions of appointment, if in force, should be clearly brought to the notice of applicants by the terms of the advertisement or otherwise.—I am, etc.,

HUGH DAVIES, D.M., D.M.R.E.,
Hon. Med. Secretary,
British Institute of Radiology.

Artificial Insemination: Moral and Aesthetic Factors

SIR,—Some recent correspondence in your columns must suggest to not a few of our profession that if we are to be worthy of the name of doctors—teachers—it behoves us to beware that what we teach is for the welfare of the community. There appear to be some who are prepared in certain circumstances to advocate extramarital artificial insemination. Such advocacy, however well-intentioned, may nevertheless be misguided. It is well to remember the old saying that hard cases make bad law, and before we accept such procedures as aesthetically and morally justifiable we should pause to consider their implications not only to individuals but to the community in general. If moral and aesthetic standards be loosened and "medical reasons" for this or that procedure become stretched to a point of infinite elasticity, then *facilis descensus Averno*.

There may be some who would say that medicine has no concern with morality, but is not medicine concerned with the general welfare? Morality signifies those standards of conduct which human experience down the ages has shown to be desirable for the healthy functioning of human society, and herein sexual relationships are a fundamental issue. The begetting, bearing, and rearing of children involve moral and spiritual factors which cannot be ignored without detriment to the welfare of the community.—I am, etc.,

Birmingham. J. R. A. TODHUNTER.

Medicine and Dentistry

SIR,—I was much interested in the letter of Dr. L. Michaelis on dentistry as a specialty of medicine. The modern dentist, trained along with his medical colleagues, must be well versed in the art and knowledge of medical science, being fully conversant with all pathological manifestations in the mouth, whether of local or systemic origin. He must be aware of all general conditions which can be caused by oral sepsis, and in this matter assist in prophylactic medicine by educating the people on the essential factor of oral hygiene.

In 1919 Dr. A. C. Fones of America presented a report of the findings of a five-year demonstration in educational and preventive dentistry carried out in all the public schools of Bridgeport, Conn. (*Dental Cosmos*, 1919, **61**, No. 7.) The scheme consisted of educating the school children in the correct method of oral hygiene and in its importance. A number of dental nurses were employed to see the plan was put into effect: they scaled and polished teeth, reporting all those needing further attention. There was a large reduction in the incidence of caries. Out of the death rates from all causes, he gives records of three diseases which are common among children—namely, diphtheria, measles, and scarlet fever. The following figures are a percentage based on 100,000 population:

	1914	1918
Diphtheria	36.6%	18.7%
Measles	20.0%	4.1%
Scarlet fever	14.1%	0.5%

During the great influenza scourge the deaths were only 5.2% per 1,000 population, the lowest on record in cities approaching the size of Bridgeport, Conn. Fones says: "When these various pernicious mouth conditions are more fully understood as the greatest factor in producing disease, medicine will acknowledge dentistry as a specialty. Also from the prophylactic standpoint, mouth hygiene will be considered the most important branch of general hygiene."

Although we lack more proof of the nature afforded by work of this kind, is it not reasonable to subscribe to the thesis that oral sepsis, apart from the question of focal infection, so reduces the resistance of the alimentary tract, respiratory system, and sinuses as to render them more susceptible to infection?

I think it will be agreed that dentistry has no small part to play in the nation's health services, and that it is in the interests of the medical profession to have an adequate dental service. Many outlived drawbacks of and prejudices against dentistry still exist, and this is reflected in the recent fall-off in the number of entrants into the dental schools. Unless adequate steps are taken, in ten years' time such an adequate service will not be possible. While the onus of raising the status of the dental profession and of ousting all these prejudices primarily rests on the shoulders of that profession, much can be done by those medically qualified by helping to educate not only the children but the masses of the public on the importance of oral hygiene.—I am, etc.,

D. JACKSON, B.D.S., L.D.S.,
Resident Dental House-surgeon, Manchester Royal Infirmary.

Pre-Nazi Medicine in Vienna

SIR,—In reply to Dr. Alan Maberly's letter (Nov. 20, p. 661) I would like to make the following observations. I rather feel that your correspondent's criticisms of the medical services in Austria were not altogether fair. In the first place there was no State Medical Service in Austria, but rather an extended panel service, as suggested by the B.M.A. for this country. The hospitals, it is true, were mainly State or municipal, but this is common to most of Europe outside Great Britain. That this service was imperfect goes without saying, but there is no evidence that these imperfections were due to an excess of public control. The charge of inhumanity was not one I heard more often there than one does here. Moreover, the standards demanded by the patient, at least in Vienna, were high, as instanced by the fact that no doctor could get on the "panel" without having done at least two years in a hospital. The patients would no more have tolerated being "Number 793" (they had, and used, the right of complaint to the panel committee) than they would have tolerated a general practitioner

with "two entrances" to his surgery! Far be it from me to criticize the medical services in this country, for which I have the highest respect and with which it is difficult to compare a poor Central European country like Austria. However, it is worth while remembering that the part of the health services the Viennese was most proud of, and which he so often showed off to the admiring visitor, was the public health services run by the City of Vienna, as instanced by the fine tuberculosis and child welfare services, etc.—I am, etc.,

West Didsbury, Manchester. HERBERT E. BACH, M.D.Vienna.

*** This correspondence is now closed.—ED., *B.M.J.*

Postgraduate Courses for Service Doctors

SIR,—There have been many letters which you have been good enough to print in your columns from Service medical officers about postgraduate courses after the war, with which many of us are in complete agreement. I think this is a very important matter which ought to be emphasized. Many of us would, before war broke out, have liked to take higher degrees or diplomas, but at the call of the Services have had to give up these ideas and also our jobs or practices, and in the case of married men our homes and families, and have made great sacrifices. We do not know what the future holds. In contrast to this, many young men in the Emergency Medical Services are sitting comparatively pretty and taking higher diplomas. We hear of young people taking the M.R.C.P. six or twelve months after qualifying. These are the people who will have all the advantages in the post-war medical world. It seems that this is unfair and needs investigation, for it may cause bad feeling afterwards.—I am, etc.,

S.M.O.

Obituary

J. SWIFT JOLY, M.D., F.R.C.S.

Mr. John Swift Joly, senior surgeon to St. Peter's Hospital for Stone, died at his home in London on Dec. 14 after a short illness. This came as very sad news to a large circle of patients and friends, for he occupied a leading position among urological consultants. He rose to this position owing partly to his outstanding scholarship and surgical skill and partly to his genial personality. He had the rare gift of making strangers feel themselves to be in the presence of a distinguished man and yet to feel at ease and at home. He was a good conversationalist, with a spice of Irish wit, and when he expressed his opinion on any controversial question his judgment always had the flavour of originality. In questions related to his own specialty his opinion was received with exceptional respect, almost with reverence. He had many quaint mannerisms which endeared him to those who had the privilege of knowing him well. For instance, he often signed his letters "Yours in haste," yet he never seemed to be in a hurry, but was willing to give time and attention to anyone who sought his aid, and he always gave generously, radiating confidence and tranquillity.

Swift Joly followed Sir John Thomson-Walker as senior surgeon to St. Peter's Hospital and seemed also to succeed him in his unique position among urological surgeons. In this circle he will, of course, be long remembered for his profound knowledge of every aspect of calculous disease of the urinary organs. His massive book on this subject was published in 1929 and became at once the authoritative work of reference. His skill and reputation as a urological surgeon brought visitors from all parts of the world to see him at work in the operating theatre at St. Peter's Hospital or to learn from him in the out-patient department. Whoever the visitor might be, renowned or obscure, he was assured of a courteous welcome. Many of Swift Joly's patients will feel that there is no one who can take his place and no one who can inspire quite the same confidence. His loss will be deeply mourned by all his patients—hospital and private alike—but even more, perhaps, by his professional colleagues, especially those who worked with him at St. Peter's Hospital. He took a personal interest in every detail of administration. He was the one to whom all could turn for advice, and he came to be loved and respected by all who worked at the hospital in any capacity.

John Swift Joly was born at Athlone in 1876, being the youngest son of the rector, the Rev. John Swift Joly. He studied medicine at Trinity College, Dublin, winning many prizes and scholarships, and graduated M.D. in 1902. Before taking the F.R.C.S.Eng. in 1907 he studied abroad at Berne and Vienna. After his appointment as assistant surgeon at St. Peter's Hospital for Stone he confined his practice to urological surgery and soon began the study of the pathology of calculous disease of the urinary tract, which was the subject of his presidential address to the Section of Urology of the Royal Society of Medicine and the theme of his book *Stone and Calculous Diseases of the Urinary Organs* (1929). During the war of 1914–18 he served in Egypt and Palestine as a major in the R.A.M.C., and was later appointed consulting urologist to the Navy. He always took a keen interest in the work of urological surgeons in other European countries and in America, and he was a corresponding member of the American, French, and Italian urological societies, and was delegate for Great Britain to the Société Internationale d'Urologie. For a time he acted as English secretary of the International Association of Urology and was always keenly interested in its activities.

Mr. Swift Joly lived and practised at 80, Harley Street, and it was there that his wife nursed him almost single-handed during his last illness. His son, at present a surgeon in the Navy, was able to visit him a few days before his death. The funeral was at Golders Green Crematorium on Dec. 16. It was Joly's wish that this should not be a public function, and the company consisted almost only of his colleagues from St. Peter's Hospital.

CUTHBERT DUKES.

SIR ARTHUR HORN, C.M.G., M.D.

We regret to announce the death on Dec. 19 of Sir Arthur Edwin Horn, consulting physician to the Colonial Office and to the Crown Agents for the Colonies, at the age of 73.

A son of William Horn of Forest Hill, he was educated at the City of Westminster School and St. Mary's Hospital. He graduated B.Sc.Lond. (with honours) in 1896, M.B. in 1899, and M.D. in 1906; and obtained the D.T.M. of Cambridge in 1907 and the M.R.C.P. diploma in 1919. During the South African War he was a civilian surgeon attached to the Field Force. He joined the West African Medical Service in 1904 and served on the Gold Coast, in North and South Nigeria, and in Gambia, and received the thanks of the Secretary of State for the Colonies for his report on cerebrospinal fever in the Northern Territory of the Gold Coast (1908), and for his report on sleeping sickness in the Volta River District of the Gold Coast (1910). He was seconded for special service in 1910–12 and was appointed personal assistant to the Principal Medical Officer, Nigeria, in 1913. His next post was that of senior M.O. and member of the Executive and Legislative Council of Gambia. In 1920 he was attached to the Rockefeller Commission for Investigating Yellow Fever, and in the following year he became Director of Medical and Sanitary Services for Malaya. He was appointed medical secretary of the Colonial Advisory Medical and Sanitary Commission of the Colonial Office in 1923. Two years later he succeeded Sir William Prout as medical adviser to the Colonial Office, and in 1928 became consulting physician. He was created C.M.G. in 1922 and received a knighthood in 1937.

Sir Arthur Horn joined the British Medical Association in 1902; he was president of the 5th Congress of the Far East Association for Tropical Medicine in 1923. In addition to his official reports he contributed papers to the *Lancet* on the health of Europeans in West and in East Africa.

CHARLES FRANCIS FENTON died on Nov. 5 as the result of a street accident. He was born on Oct. 26, 1863, and educated at Brentwood Grammar School. At the age of 17 he was apprenticed to a tea-taster in Mincing Lane, but in 1882 became a student at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1886. He was a dresser to Sir Frederick Treves, contemporary with such people as F. J. Smith and young Jonathan Hutchinson (son of Sir Jonathan Hutchinson, the investigator of syphilis, whose name remains in "Hutchinson's teeth"). He went to Barking in 1888, after doing an assistantship at Wivenhoe, Essex, and acted at the same time as a clinical assistant at the London Hospital, and also at Moorfields. In 1896 Dr. Fenton was appointed part-time M.O.H. at Barking, which post he held until 1909, when full-time appointments for medical officers of health were first introduced on a national scale. While in charge of the first isolation hospital in Barking he was one of the first to use antidiphtheritic toxin in the area. He was of the old type of general practitioner, the true

family doctor who not only advised from a medical point of view but was the family adviser and friend also. Dr. Fenton was in practice in Barking for 55 years.—H. C. B.

Dr. JOHN ROBERT WILLIAMS of Penmaenmawr, J.P. for Caernarvonshire and at one time High Sheriff of the county, died in a nursing home on Dec. 15, aged 81. He studied medicine at the University of Edinburgh, taking the M.B. and C.M. degrees in 1890, and afterwards attended hospitals in London and Paris; he was then for a time demonstrator of anatomy at the Royal College of Surgeons of Edinburgh. For well over twenty years he held the posts of surgeon to the Penmaenmawr and Welsh Granite Quarries and visiting physician to the Manchester and Salford convalescent homes. Dr. J. R. Williams was a keen officer of the R.A.M.C.(T.F.), attaining the rank of major and being awarded the Territorial Decoration; in the last war he served over-seas with the 6th Battalion Welch Fusiliers. In 1922 he was appointed a Knight of Grace of the Order of St. John of Jerusalem in England. He joined the B.M.A. in 1899 and held office as president of the North Wales Branch in 1927–8. He was also a Fellow of the Physical Society and of the Royal Meteorological Society, and being a skilled draughtsman illustrated a number of medical and anatomical works. Until old age claimed him he enjoyed a day's shooting or sailing, and had long been a member of the Royal Welsh Yacht Club.

Medical Notes in Parliament

The Education Bill

The text of the new Education Bill, which when enacted will supersede all existing Education Acts, has now been issued. The Bill is based on the White Paper published last July (*Journal*, Sept. 4, p. 304), and includes all the legislative changes proposed in that paper.

Training and Resettlement of Disabled Persons

Mr. TOMLINSON on Dec. 10 moved the second reading of the Disabled Persons (Employment) Bill. He said the report of the Interdepartmental Committee on the Rehabilitation and Resettlement of Disabled Persons, presented to the House in January, 1943, attempted for the first time to treat rehabilitation and resettlement as a single problem and a continuous process. It was felt that medical science and industrial experience might be complementary to one another. To let a patient know in hospital, soon after his accident and in the presence of his medical adviser, that someone was ready to assist him to take up his work when better, or to train him in other work, might assist more than anything else in making the skill of the surgeon effective. Whatever the disability and whether incurred in industry or on the battlefield, the first step must be to convince the patient that help was possible. Experience in an interim scheme had taught the value of training for a new occupation wherever the disability prevented return to a previous one. The work of the limb-fitting specialists under the Ministry of Pensions at the centres established for that purpose was beyond praise. Experience at Papworth showed that, with the doctor determining the number of hours the individual should work, such work under supervision aided recovery in many tuberculous cases. It was now part of the Bill to make provision for medical rehabilitation, which came under the comprehensive medical service and was being planned. The Bill dealt with the phases of rehabilitation and resettlement which were necessary in addition to medical treatment. It proposed courses of industrial rehabilitation and vocational training. It also proposed a statutory obligation on employers to assist disabled persons to get employment in the ordinary field of industry and commerce. Special facilities were proposed for those whose disablement unfitted them permanently, or for a substantial period, for ordinary employment. War-disabled persons were covered by the Bill like other disabled persons. In spite of the King's Roll, statutory compulsion to employ was necessary.

Major GATES said that in the Ford factory it had been shown that 88% of the jobs in that factory could be carried out by the disabled. Employers would find that the disabled were the most reliable workpeople and among the least accident and the least sickness prone. Mr. ISAACS recalled that the British Medical Association, in conjunction with the Trade Union Congress, had discussed these problems in 1937. Establishment of rehabilitation centres followed. Sir IAN FRASER said that in the last 30 years the percentage of unemployment among disabled men had never been so high as among the fit. Mr. MESSER was glad that the Bill would apply to persons suffering from congenital deformity.

Replying to the debate Mr. BEVIN said the Bill would dovetail in the new Education Bill. He hoped to set up local advisory committees, including hospital people.

The Bill was read a second time.

Supply of Penicillin

Mr. CHARLES PEAT, in reply on Dec. 16 to Mr. Craik Henderson and Major Lyons, said arrangements had been made to produce as much penicillin as possible. There was at present only a small quantity. The total supply would for some considerable time be insufficient to meet Service requirements. Limited quantities were being made available, in consultation with the Ministry of Health and the Medical Research Council, for clinical trials. Efforts would also be made, as soon as circumstances permitted, to allocate some supplies for the civilian population, but he could give no indication when they would be generally available.

Regulation 33B in Operation

Up to June 30, 1943, the latest date for which figures are available, the number of persons who were reported as alleged sources of venereal infection by two or more persons under treatment, which is necessary for the operation of Regulation 33B, was 110, and by the same date 71 of these had been brought under treatment by local authorities. About 220 other persons out of approximately 1,780 in respect of whom only one report reached medical officers of health (and who were not, therefore, subject to action under the Regulation) were induced to undertake treatment when informally approached as a result of the single report.

Scientific Training and Research

A deputation from the Parliamentary and Scientific Committee was received on Dec. 15 by Mr. Ashley, Sir John Anderson, Sir William Jowitt, and Lord Cherwell. Lord SAMUEL headed the deputation, which asked for more Government encouragement to scientific and technical training after the war. Mr. E. W. SALT suggested an additional grant of £1,000,000 to the universities for research and training. Mr. ATTLEE indicated that the Treasury was sympathetically inclined. He said plans for science, both fundamental and applied, were prominent in the thoughts of the Government.

Recuperation of War Workers

Mr. WILLINK announced on Dec. 16 a scheme to provide treatment under medical supervision for workers showing signs of war strain although not suffering from serious illness. He said that in consultation with the Ministry of Labour he had decided, with the co-operation of the War Organization of the British Red Cross and Order of St. John, to arrange for workers to be admitted to a number of country houses hitherto used by that Organization as auxiliary hospitals but not at present needed for that purpose. The War Organization was now selecting accommodation suitable, geographically and otherwise, for this new use. This was an experiment in a new field of social medicine, and the provision must be on a modest scale in the first instance, as the number of centres available was limited. The intention was that individual workers would be selected by co-operative action on the part of their own doctors, their employers' medical officers, and the medical staff of his Department. The course of treatment, which would normally last for two weeks and sometimes rather longer, would consist of physical exercises, indoor and outdoor occupations, and organized games and excursions, all graded according to the condition of the individuals and conducted on lines as far removed as possible from what was usually called the hospital atmosphere. The object was not only to prevent further impairment of the worker's health but to tone him up, physically and mentally, so that he could return to his normal life with renewed vigour and efficiency.

Medical Examination of Fitness for Mines

On Dec. 17, on the motion for the Christmas adjournment, Col. LANCASTER opened a discussion on the impending call of young men to the mines. He said recruiting by ballot ignored all the data collected by the Service Departments since the beginning of the war in regard to psychological tests. Medical examinations of these young men by district medical boards must be more searching than those made for recruits for the armed Forces. So far as South Wales was concerned, examination of the lungs would be necessary. In examining entrants for the Forces there was a reasonable expectation that minor deficiencies would be improved by military life. In the case of these young men there would be no safety margin. Within a month or so of their presenting themselves they would be going underground and there would be little opportunity of an improvement in the medical condition. If they were not fit

they would be an increasing source of worry to already overworked managements. If as a result of physical or temperamental disability these men were subsequently found unsuitable for mining they should be boarded out by the same medical board, thus saving the friction caused by this having to be done by the local medical practitioner. Machinery must be installed to get rid at the earliest moment of young men found to be unsuitable. At present in the Midlands area boys going into the pits were examined by the medical practitioners of the district. Mr. SLOAN said he had never known of any medical examination to which youths were put before going down the pit. He agreed that there should be one. Mr. COLEGATE also said he had never known of such examinations in his district. His friends would welcome medical examinations of the boys from mining villages who were recruited into the industry. Such entrants would be fewer if they had the same searching examination as for the drafted entrants.

Mr. BEVIN welcomed the acceptance of the idea of a medical examination. This must be a Government examination and must be carried out so that if a slight defect were found the person examined did not feel the world was at an end for him. The employer should not know the result. This should be a matter between the Board, the State, and the person concerned. It would be wrong to let a boy go into the pit if there was proneness to lung trouble. In the light of the last 30 years he thought there had not been enough research in the mining industry on what should be looked for in a medical examination. In the chemical trades it was found that to let people with certain tendencies go into certain processes meant ill-health and a great economic loss. He thought the mining examinations would result in a stepping-up of medical knowledge. The Government would exercise the greatest care and would try to learn from this experiment as it had done in connexion with the Services and in industry.

Scottish Scientific Advisory Committee

The present members of the Scientific Advisory Committee to the Secretary of State for Scotland are Sir John Orr (chairman), Prof. C. H. Browning, Prof. F. A. E. Crew, Prof. I. de Burgh Daly, Sir John Fraser, Prof. D. Murray Lyon, Sir Alex. Macgregor, Prof. T. J. Mackie, Sir Edward Mellanby, and Prof. W. J. Tulloch.

It is a practice of the Committee to delegate special investigations to expert subcommittees to which non-members are co-opted.

The Services

The following appointments, awards, and mentions in recognition of gallant and distinguished services in Burma and on the Eastern Frontier of India have been announced in the *London Gazette*:

C.B.E. (Military Division).—Col. (Temp.) B. Basu, O.B.E., I.M.S.

O.B.E. (Military Division).—Col. (Acting) J. A. Matheson, Col. (Temp.) M. Morris, Major (Temp. Lieut.-Col.) V. J. Perez, R.A.M.C.; Col. (Acting) C. C. Kapila, Major (Temp. Lieut.-Col.) C. F. J. Cropper, I.A.M.C.

M.B.E. (Military Division).—Capts. (Acting Majors) G. D. W. Adamson, J. S. Kerss, R.A.M.C.; Capts. J. B. Hurll, J. G. Scott, R.A.M.C.; Major J. F. Shepherd, Capt. (Acting Major) L. S. F. Woodhead, Jemadars (Acting Subadars) (Assistant Surgeons) V. D. Sharma, C. Singh, I.A.M.C.; Assistant Surgeon (British Cadre) 1st Class A. V. Barker, I.M.D.

D.S.O.—Major (Temp. Lieut.-Col.) G. R. Marshall, R.A.M.C.

M.C.—Capt. N. P. Mahapatra, I.A.M.C.

Mentioned in Dispatches.—Brig. (Temp.) G. D. MacAlevey, D.S.O., M.C. Col. (Acting) W. J. Officer, Majors (Temp. Lieut.-Cols.) D. M. Ahern, J. H. Baird (Reserve of Officers), A. N. T. Meneces, R.A.M.C.; Capt. (Acting Lieut.-Col.) F. J. Manning, Capts. (Temp. Majors) J. D. Allan, J. C. Babbage, G. B. Heugh, R. A. O. Leroux, J. McGhie, R.A.M.C.; Capts. P. H. Birks, R. A. Coughlan, T. B. Harrison, W. H. Ashford-Brown, T. A. B. Mason, J. Morrison, H. O'Hara, M.C., A. Waymouth, D. G. C. Whyte, R.A.M.C.; Major-Gen. A. C. Munro, C.B., K.H.P., Indian Army; Capt. B. K. Banerjee, I.M.S.; Col. A. C. Taylor, Col. (Temp.) J. E. Ainsley, Majors (Temp. Lieut.-Cols.) J. A. Anderson, J. Duffy, R.A.M.C.; Major (Acting Lieut.-Col.) G. F. Harris, Capts. (Temp. Majors) W. S. Hacon, H. B. T. Holland, D. S. Khatav, I.A.M.C.; Capts. A. E. Stevens, G. Audikesavala, B. Barat, G. V. Faulkner, K. N. Gabbar, C. K. Hassan, G. L. Joshi, M. A. Khan, M. Khan, A. I. Lakshminarayanan, D. N. Maniktala, A. K. Mukerji, J. L. Roberts, G. Quayle, R. S. Tata, R.A.M.C.; Lieuts. (Temp. Capts.) N. R. Doni, N. J. McQueen, Lieut. (Acting Capt.) S. T. Gopalakrishnan, I.A.M.C.; Jemadar M. S. Qureshi, I.A.M.C.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Temp. Surg. Lieut. J. R. Ellis, R.N.V.R., for distinguished services in connexion with the operations which led to the capture of Sicily by Allied Forces, and of Temp. Surg. Lieut. A. A. McC. Miller, R.N.V.R., for services to the wounded after an air attack.

CASUALTIES IN THE MEDICAL SERVICES

Died on active service.—Capt. M. Evnine, R.A.M.C.

Died.—War Subs. Capt. N. N. Wilson, R.A.M.C.

Killed in an aircraft accident in South Africa.—Fl. Lieut. C. F. H. Wiessner, R.A.F.M.S.

Universities and Colleges

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

Final M.B., Ch.B., Part III.—[1]A. H. Swithinbank, J. Ainsworth, A. S. Beadel, K. W. Boggis, A. M. Brenner, E. F. B. Cadman, Constance M. Davis, P. S. Dearden, Margaret P. Diamond, E. G. Donovan, J. F. Ferguson, H. Francis, J. Gould, Betty Hargreaves, E. T. Harrison, H. Holden, Winifred L. Hollick, C. A. Hopkins, J. G. P. Jones, J. D. King, J. Langley, V. Leitner, A. McPherson, W. E. S. Marshall, J. W. Maybury, Janet B. Mercer, Sheila L. Richardson, J. J. Rivlin, Irene W. Simpson, W. Sircus, C. Taylor, K. B. Thomas, D. W. Townley, Simone J. van Son, J. G. Warbrick, Elspeth M. Whittaker, Margaret A. Williams, F. B. Wright. *Passed in Separate Subjects*: P. M. Edis (Surgery, Obstetrics, and Gynaecology). K. B. N. Freeman and A. Stone (Medicine, Obstetrics, and Gynaecology). J. E. Hall and Barbara K. Thompson (Medicine and Surgery). *Part I*: H. T. Davenport, Monica Drinkel, M. M. el Haddad, L. Griffiths, B. B. Harrison, Muriel E. St. Pier, W. L. Sanders.

[1] Class II Honours and Distinction in Surgery.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on Dec. 17, with Prof. R. W. Johnstone, President, in the chair, the following who passed the requisite examinations were admitted Fellows:

A. C. Buchan, M. L. Burman, V. H. J. Davies, J. C. Dundon, G. R. Fisk, T. Fletcher, R. H. Foster, M. D. Hickey, W. D. Lovelock-Jones, W. E. Pollett, G. I. Roberts, D. F. Walsh.

Medical News

The Harben Lectures will be given in the Lecture Hall of the Royal Institute of Public Health and Hygiene, 28, Portland Place, W., by Dr. Melville D. Mackenzie, chairman of the Medical Advisory Committee, Inter-Allied Committee for Post-war Requirements, on Jan. 24, 25, and 26 at 3 p.m. Dr. Mackenzie's subject is "A Study of the Potentialities of International Collaboration in Medicine in the Post-war World." Those wishing to be present are asked to notify the Secretary of the Institute. Admission is free.

The Association of Scientific Workers is arranging a film show at the Cambridge Theatre, London, W.C.2, on Sunday, Jan. 30, at 6.30 p.m., in aid of its Stalingrad Hospital Laboratory Fund. The main feature will be "World of Plenty," to be followed by other films of scientific interest. Tickets at 2s. 6d. to 21s. can be obtained from the association at 59, New Oxford Street, W.C.

Some of the aims of the Scientific Film Association, which came into being on Nov. 20, are: To promote the national and international use of the scientific film in order to achieve the widest possible understanding and appreciation of scientific method and outlook; to collect, collate, and distribute information on the scientific film; to publish comprehensive lists of films graded according to merit and suitability for audiences; to establish relations with Government Departments, public bodies, etc., which are in a position to make, use, or circulate scientific films; to organize a panel of scientists to advise film producers on scientific matters; to promote the production and distribution of scientific films; and to encourage the setting up of scientific film societies. The medical member of the council of the association is Mr. McAdam Eccles. Inquiries should be sent to the honorary secretary at 51, Fitzjohn's Avenue, London, N.W.3.

The Bernhard Baron Trustees' grant of £30,000 towards the partial completion of the nurses' home of Queen Charlotte's Maternity Hospital is conditional on the work being carried out by the end of 1944, and this means that the hospital must raise the balance of £17,000 required in the next twelve months. Queen Charlotte's has already raised nearly half a million pounds towards completing the largest maternity hospital in the Empire.

The issue of the *Schweizerische Medizinische Wochenschrift* for Sept. 4 is devoted to papers on cancer read on Oct. 11, 1942, at the Swiss National League for the Campaign against Cancer.

The name of the Chartered Society of Massage and Medical Gymnastics has now, by permission of the Privy Council, been changed to the Chartered Society of Physiotherapy.

A Medical Faculty has recently been founded at Salonika, in which 400 students have been registered.

Dr. Leslie G. Housden has succeeded the late Dr. Eric Pritchard as one of the honorary medical advisers of the Save the Children Fund.

Dr. Eugenio A. Galli has been appointed president of the National Department of Hygiene of Argentina.

EPIDEMIOLOGICAL NOTES

Influenza

The number of deaths attributed to influenza in the great towns during the seven weeks Nov. 6 to Dec. 18 were 31, 46, 106, 375, 709, 1,148, and 1,115. These numbers would have been slightly higher—by about 9%—if the pre-1940 system of classification of deaths had been retained.

The wave of influenza that has spread over the country and the rapid increase in mortality common in large epidemics have aroused general concern. Noteworthy, also, are the reports of widespread epidemics in the U.S.A. and in Germany. The mortality figures are the only measurable indication we have of incidence. But distracted industrial managers, and, last but not least, the harassed and overburdened general practitioner, tell their own tale. Mortality falls on all classes alike, with the exception that infants under 2 in the lower social class have a higher mortality from influenza than those in the upper classes.

The epidemiology of influenza has been extensively studied, but adequate solutions to many of the problems have yet to be found, and results obtained from one epidemic are not in accordance with those of another. Influenza appears to be independent of climatic and meteorological conditions, for epidemics have occurred throughout the world and have begun at varying periods of the year. Though we have evidence that large influenza epidemics have appeared at intervals for several hundred years, this disease did not appear as a major cause in the classification of deaths in recent times until 1890. In that year 4,523 persons died from influenza, compared with an average of 99 for the ten preceding years. In the two following years—1891 and 1892—16,686 and 15,737 deaths were recorded, and the deaths remained at a high level during the subsequent years. From 1893 to 1917 the annual number of deaths ranged from 3,753 to 16,245. A feature of this period was the seasonal rise to a maximum in the early months of the year, generally from January to March. In June, 1918, the great epidemic began, and of the 112,329 deaths in that year 98,280 occurred in the fourth quarter. The epidemic declined during the winter but rose to a secondary maximum during the spring of 1919, and 44,801 deaths were recorded during that year. The mortality then declined, but remained above the level of the preceding thirty years. During 1920–39 the annual deaths varied from 5,019 to 29,084. The largest epidemics during this period were in 1922, 1927, 1929, and 1933, the number of deaths being respectively 21,498, 22,263, 29,084, and 22,990. In six of the remaining fourteen years the deaths numbered between 10,000 and 20,000. During recent years the seasonal trend has been fairly uniform, the deaths beginning to rise at the end of December or the beginning of January; the maximum occurred between the fourth and eighth weeks during 1937–43.

The present outbreak is in contrast to recent experience: it began about two months earlier than usual and has already reached a higher level than has been recorded since 1937. It is impossible to foretell its course. Previous large outbreaks have been almost symmetrical—a rapid rise to a maximum and an equally rapid fall. An epidemic usually lasts from 10 to 12 weeks. If the present epidemic follows this course it is probable that a secondary rise will occur in the late spring. Secondary epidemics are usually not so symmetrical as the primary epidemic and the peak is not so pronounced, but they persist for a longer period.

So far as is known there has been no large change in the distribution of the age of death, as was the case in the 1918 epidemic. During 1890 to 1917 influenza was chiefly concentrated at ages 55+, but in 1918 the age distribution of mortality underwent a sudden and remarkable change, and affected the younger members (under 35) of the population very much more than those at older ages.

The Week Ending December 18

The returns of infectious diseases during the week for England and Wales included: scarlet fever 1,936, whooping-cough 1,400, diphtheria 550, measles 416, acute pneumonia 2,593, cerebrospinal fever 64, dysentery 133, paratyphoid 1, typhoid 3. There were 1,115 deaths due to influenza in the great towns.

J. P. Murphy, G. S. Bozalis, and E. J. Bieri (*Amer. J. Dis. Child.*, 1943, **66**, 264) studied the blood diastase in 35 cases of mumps of all ages and both sexes with or without complications and at various stages of the disease, and found that in 58 determinations only 7 were below 200. They came to the conclusion that in the overwhelming majority of mumps cases the blood diastase is raised, whereas in cervical adenitis the diastase is low, so that this occurrence is of diagnostic value.

No. 49

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 11.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943 (a)	1943 (b)	1943 (c)	1943 (d)	1943 (e)	1942 (Corresponding Week) (a)	1942 (b)	1942 (c)	1942 (d)	1942 (e)
Cerebrospinal fever	77	10	28	2	2	75	6	16	2	5
Deaths		1	—				1	1		
Diphtheria	634	29	178	126	45	1,079	41	265	86	25
Deaths	11	2	4	1	—	21	3	1	2	—
Dysentery	166	25	55	—	—	133	19	53	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	3	—	1	—	—
Deaths		1					1			
Erysipelas			46	9	2			71	6	2
Deaths		1					—			
Infective enteritis or diarrhoea under 2 years				18					66	
Deaths	44	7	9	10	5	51	5	9	10	2
Measles	444	50	53	44	1	13,287	459	563	36	28
Deaths	1	—	1	1	—	14	1	5	—	—
Ophthalmia neonatorum	66	1	2	13	1	69	5	12	—	—
Deaths										
Paratyphoid fever	2	—	1	—		7	1	—	—	
Deaths	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenzal*	2,956	251	29	7	7	989	61	11	5	1
Deaths (from influenza)	1,148	128	58	3	5	42	2	7	1	—
Pneumonia, primary			31	19				236	39	
Deaths		176		30	18		—		23	13
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	11	—	—	1	—	7	—	2	12	4
Deaths		—					—			
Puerperal fever		4	10	—	—		2	13	—	—
Deaths		—					—			
Puerperal pyrexia†	162	7	10		—	174	15	22		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,564	178	316	25	86	2,769	148	453	95	39
Deaths	—	—	1	—	—	—	—	—	—	—
Smallpox	—	—	—		—	1	—	6		—
Deaths			—	—	—			—	—	—
Typhoid fever	5	4	3	6	—	10	1	—	7	—
Deaths	—	—	—	—	—	1	1	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,641	149	233	23	24	1,326	72	46	29	7
Deaths	11	2	4	1	3	5	—	1	2	1
Deaths (0–1 year)	387	47	77	44	36	388	44	75	42	18
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	8,832	1,437	874	253	159	4,896	711	619	243	141
Annual death rate (per 1,000 persons living)			19·7	16·6	‡			13·9	16·2	‡
Live births	5,896	723	807	324	235	5,744	666	839	290	233
Annual rate per 1,000 persons living			16·5	21·3	‡			17·3	19·4	‡
Stillbirths	199	23	34			230	25	29		
Rate per 1,000 total births (including stillborn)			40					33		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Analgesia in Labour

Q.—*What is the present position regarding analgesia during labour? Are there any risks in the use of scopolamine? What is the dosage recommended, and how early in labour should it be given? Is a rapidly acting barbiturate to be recommended, and if so in what dosage?*

A.—A few women express a wish to go through labour unassisted by analgesics. Some of them change their views before labour ends. A few doctors claim that with adequate ante-natal preparation a woman does not need sedatives during labour, and encouraging results in small selected series are produced to support their view. The majority of patients and obstetricians believe that analgesia is necessary. If the choice and dosage of drug are wise and the administration timely, pain is relieved, labour is shortened, and is made safer for both mother and babe. Scopolamine gives its best results when used in combination with morphine, but considerable care is necessary if good results are to be obtained and unfortunate sequelae prevented. There should be a nurse adequately trained in obstetrics and in the use of this particular analgesic in constant attendance on the case. The doctor must be prepared to devote even more time than usual to watching the patient during her labour. There must be facilities for nursing the patient in a quiet room, and no sedative should be given, preferably, within 3 hours of the birth of the babe. Even with these precautions blue asphyxia is common, with the added risk for the babe of atelectasis and pulmonary infections. The use of scopolamine (hyoscine) is not free from risk. When first-stage pains become regular and strong 1/6 gr. morphine with 1/150 gr. scopolamine is given. Subsequently, 1/450 gr. is given as required to keep the patient quiet. It should not be repeated more frequently than hourly and should not be given in the second stage. The morphine is not repeated.

The barbiturates are widely used at the present time. One that does not produce the extreme excitement occasionally met with is to be preferred. A good combination is to give this by mouth in combination with morphine or heroin by injection when first-stage pains become strong and regular. In a primigravida 1/6 gr. heroin with 6 gr. hebaral gives excellent results in a normal labour lasting less than 24 hours.

Intra-uterine Douche in Puerperium

Q.—*For some years I have used a copious intra-uterine douche followed by glycerin in puerperal cases with offensive lochia in large subinvoluted uteri. This treatment facilitates drainage through an oedematous infected cervix and removes debris retained beyond the reach of chemotherapy. I have found the results consistently good. Fetor is reduced and there has been no case of spread of infection. There is little distress to the patient, and quite often dramatic results. An anaesthetic is never necessary. A review of the literature reveals that this practice is universally condemned, but no facts or figures are given to substantiate the condemnation. Wherein have I sinned?*

A.—Not at all. You have been fortunate. If a uterus is infected and the flow of lochia is obstructed, the correct thing to do is to establish drainage. Gentle flushing with a hot intra-uterine douche is a reasonable and—as you have found—successful method of treatment. If, however, placental tissue is retained, then you are fortunate if you manage to wash it away in this fashion. To leave it is asking for trouble, and the wisest plan if you suspect the presence of retained placental tissue is to explore the uterus gently with the finger or with sponge forceps. To do this properly you *will* require an anaesthetic, and on occasions the retained tissue is closely attached to the uterine wall. The greatest care is essential if perforation is to be avoided.

Vertigo and Vomiting in Middle-aged Women

Q.—*During the last two years I have had a very large number of patients suffering from vertigo for which I can find no adequate reason. The most severe case was one where feeding was difficult because whenever the head was raised from the pillow the patient vomited every time because the vertigo was so severe. The only constant factor in these cases appears to be that the patients are all women and all over 40. I may add that the majority are transient cases of a few weeks' duration, but some have been more persistent.*

A.—It is not stated whether any other symptom or sign such as deafness or nystagmus was present, but apparently there was nothing except vomiting. It seems, therefore, not to be due to a unilateral obstruction of the Eustachian tube with labyrinthine disturbance. It might be functional or due to an epidemic of encephalitis. However, women over 40 often drink tea to excess, and this is quite able to produce severe attacks of vertigo with nystagmus and vomiting, but not necessarily deafness.

Food-poisoning Outbreak

Q.—*During August, September, and October there were in a South Devon district a large number of cases of gastro-enteritis. The symptoms are severe prostration, vomiting, and diarrhoea, the latter of an explosive type, coming on suddenly at times and without warning. Colitis is prominent and persists after the gastric symptoms have subsided. The treatment consists of mixtures containing kaolin, bismuth, rhei co., and sedatives. In one small village 50% of the inhabitants were stricken down suddenly. Suggestions for the treatment of the colitis would be welcomed.*

A.—These outbreaks are almost certainly "food-poisoning" in its widest sense. The Salmonella and dysentery organisms are probable causes, the persistent colitis suggesting, more particularly, *B. dysenteriae*. Bacteriological diagnosis must be made before satisfactory treatment can be suggested. The condition, whether true dysentery or non-specific food-poisoning, is compulsorily notifiable to the medical officer of health.

What is Fibrositis?

Q.—*What is the pathological explanation of the dramatically sudden and devastating onset of "fibrositis" in an acute attack of lumbago, whereby an apparently fit individual is converted in a fraction of a second into a helpless and agonized cripple? Why not a gradual onset?*

A.—In his original description of fibrositis Sir William Gowers considered that the pain originated in the muscle spindles, the end-organs of the afferent nerves which lie between the muscle fibres and in intimate association with them. While it is obviously impossible to demonstrate the manner in which the characteristic pain is evoked, it may be assumed by analogy that it is due to compression of the muscle spindles by spasm of the adjacent muscle fibres, and is thus of a similar nature to the cramps commonly occurring in the muscles of the extremities. While the acute onset is brought about by some movement involving the muscles concerned, there has been a gradual accumulation of toxic products in the tissues leading up to the acute attack—when, so to speak, the pot boils over. Cases with a gradual onset are common enough both in the lumbar muscles and elsewhere, but rarely reach the same intensity of pain; anatomical relations, function, and blood supply all probably have a bearing. It is questionable whether the term fibrositis is not used too freely—sometimes, indeed, as a cloak for ignorance; and myalgia, myositis, fibromyositis might be recognized as varieties in close association in symptomatology. A symposium on fibrositis in its various aspects appeared in the *Annals of the Rheumatic Diseases*, December, 1940, vol. ii, No. 2.

A Hungry Diabetic

Q.—*A potential diabetic, who can keep sugar-free by careful dieting and without insulin, finds his menu is very limited, and hunger is acute at times. Could you name some cereals or flour, or other preparations of a sustaining nature, that might be taken? Can soya flour be baked in loaf form or taken for breakfast as a cereal?*

A.—If a potential diabetic, who is being carefully dieted, feels hungry he is not having enough to eat. The best treatment is to increase the carbohydrate of the diet sufficiently to satisfy the patient and to give insulin if glycosuria occurs. This treatment will improve his health very much, and he may then be able to give up insulin and still keep the urine sugar-free. If he refuses to have the best treatment, he could eat larger amounts of green vegetables, like cabbage, cauliflower, etc., which contain little carbohydrate, or he could use the so-called "diabetic foods." Some of these contain protein and fat and the minimum of carbohydrate, but many patients do not like their taste. Most so-called "diabetic foods" contain a fair amount of carbohydrate and are pleasanter to take, but they may cause a return of the glycosuria. Soya-bean flour can be used for bread and cakes. The sooner a patient of this type starts insulin,

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if it is necessary to control a glycosuria caused by a good diet, the less insulin he will need and the greater the chance of giving up insulin; whereas the longer the delay, the greater the dose and the less chance of giving up insulin.

Post-herpetic Neuralgia

Q.—*Three years ago a patient of mine had shingles on the 8th thoracic nerve. Since then she has had intractable neuralgia along the course of the same nerve. Pituitrin was given at the time. Since then iodides in large doses, massive vitamin B_1 injections, nerve section, etc., have been tried without any effect. The patient herself is not a neurotic type. She declines surgical removal of the ganglion. I should be grateful for any advice that can be given.*

A.—Post-herpetic neuralgia is one of the most difficult neuralgias to treat successfully. It is liable to be most intractable in people of 60 and upwards. It is usually made worse by the more active treatments such as injections or nerve section, and your patient is certainly wise in refusing surgical removal of the ganglion. Local application of percainal ointment and the administration of mild analgesics such as tab. codein. co. may assist somewhat. Morphine should be avoided.

Masturbation in Men

Q.—*Would it be true and right to tell a man aged 20 in the Forces that masturbation was a lesser evil than fornication? What are the ill results of masturbation?*

A.—A decision whether it is ethically better to obtain relief for prolonged sexual excitement by masturbation or by extramarital intercourse must of course be left to the patient. He will decide on the basis of his views about marriage. If it is against his principles to have intercourse with a woman to whom he is not married, or if there is no opportunity for this, or an opportunity which is distasteful to him, he can be assured that occasional masturbation can be resorted to without danger to his health or to his future sexual life. If he decides to adopt this measure he should be told to adopt it deliberately, knowing that it is an emergency measure undertaken deliberately and after careful consideration. No sense of guilt should be attached to the act, and it should be resorted to only when it seems essential to obtain relief for a sexual tension which has become unbearable. If masturbation is used in this way and not merely for pleasure, it will be unlikely to become a preferable substitute for normal intercourse in the future. He must be told, also, that the ill effects that are popularly supposed to follow masturbation are usually due to excessive masturbation, to the anxiety following the act, or to a feeling of guilt on the part of the masturbator. In order that he may only have to resort to this method of relief as seldom as possible, he should be given the usual advice to occupy his leisure with as many interests as possible so that his energies may be directed along other than sexual channels. Finally, he should be made to realize that all normal young men are faced with these difficulties and have to find their own solution for them.

Chilblains

Q.—*What steps can be taken to relieve the irritation due to chilblains? I seem to remember an article claiming that the use of an extract of bee venom was efficacious. Is there really a drug or treatment which has an obvious effect for good? Has vitamin therapy been beneficial?*

A.—The irritation of chilblains can often be relieved with benzocaine ointment. The treatment still proves a baffling problem, and its lack of success is mirrored in the multiplicity of the alleged cures. Different patients respond to different remedies. Thus some are relieved by large doses of calcium and others—a very few—by thyroid. Hormonal preparations and vitamins have been extensively tried out with advantage to the vendors rather than the victims. Jacquet's exercises, where the fingers are slowly bent forwards and backwards for five minutes night and morning, are most helpful. It may be added that small doses of *x* rays are prophylactic, with the reservation that this treatment should be given only by a practitioner fully conversant with superficial radiotherapy.

Milker's Node

Q.—*May I have suggestions for the treatment of a "milker's node," occurring in a land girl's finger?*

A.—The term "milker's nodes" is correctly used to describe the bluish-red nodules which develop in the hands of dairymen and milkmaids, the result of what is probably a virus infection. As they usually clear up spontaneously, a persistent eruption should suggest an alternative diagnosis. Other conditions are liable to cause confusion, such as the lesions produced by the irritation from the fine animal hairs which penetrate the skin, and may indeed produce the milker's nodes. Or attenuated cow-pox. In this connexion it will be recalled that Jenner's discovery was based upon the freedom of milkmaids from smallpox, the effect of a protective inoculation, and that the famous milkmaids' complexion was nothing more than freedom from pock marks, a universal disfigurement in Jenner's time.

INCOME TAX

Employment Expenses

E. H. inquires with regard to the undermentioned expenses.

*** (1) Membership of associations, etc.—the fees are deductible if membership is required by the employer as a condition of employment. (2) Fees and expenses in connexion with examinations are *not* allowable. (3) The cost of a private telephone—a proportion, according to the ratio of private to professional use, will be allowed if the installation is required by the employing authority.

Service in the Army

A. B. was in the Army from Oct., 1939, to Nov., 1941, and tax was deducted from his pay. He then took up civil employment, and the local income-tax officer is now calculating his liability for the year ending April 5, 1942.

*** The local assessment will cover only the civilian service, and consequently the tax deducted during Army service will not be reflected in the calculation. On application to the inspector of taxes, however, A. B. can presumably be supplied with a statement setting out the *whole* of his earnings as charged to tax—so much Army pay less so much tax, and so much civilian remuneration being assessed locally. With regard to the "car allowance" received, the employing authority can no doubt state what it is intended to cover. The normal practice is for the allowance to be regarded as covering all expenses, direct and indirect, incurred in connexion with the car, and for the existence of the allowance and of the expenses to be ignored for income-tax purposes.

Private Use of Motor Car

R. H. has claimed £82 in respect of his car—wear and tear, petrol, tax and insurance, etc. The inspector of taxes has disallowed 1/3=£27 as relating to "private use."

*** As R. H. points out, private use of a car is prohibited and consequently the whole use of the car is for professional purposes. The Revenue has always taken the view that where expenses are "general" in character—e.g., rent, cost of car, telephone, etc.—the ratio to be applied as between professional and private use must depend on the facts of the particular case during the period forming the basis of the assessment. The claim to deduct 1/3rd for private use should be resisted, in so far as it applied to a period during which the car was not so used.

Cost of Instruments

S. S. has claimed to deduct the cost of instruments bought after qualification for use as an assistant. The inspector has refused to allow the deduction on the grounds that the expense is not necessary—possibly on the view that the principal should provide the instruments.

*** Whether or not there are merits in the inspector's view of the word "necessary," the claim is inadmissible. Such purchases are allowable only when they are *in replacement* of instruments, etc.; the cost of the original equipment is an outlay of capital, not an "income" expense.

Wife's Earned Income

A. J. inquires how his wife's earned income (£220 per annum) should be assessed.

*** The tax due for the year to April 5, 1944, assuming that the £220 applies to the whole year, would be as shown below:

Income			£220
Deduct: Earned income allowance	£22		
Special personal allowance	£80		
		£102	
		£118	
Tax at 10s. in the £			£59

Acquisition of Additional Accommodation

A. D. inquires whether he would receive an allowance in respect of further professional accommodation which he contemplates acquiring in addition to the partial use of his present residence.

*** Yes. If additional premises are used wholly for professional purposes the full amount of the rent (or if he owns the premises the annual value), rates, and other running costs will be allowed, but not the cost of acquiring the premises—e.g., stamp duty, legal expenses, etc. No allowance would be made for premises taken over until they are in fact used professionally. It is immaterial whether the premises are furnished or unfurnished. If part of the premises are sublet, the deduction allowed will be restricted to a reasonable proportion of the total rent, etc., paid for the whole premises.

LETTERS, NOTES, ETC.

Masturbation in Women

Dr. C. J. LODGE PATCH writes from Shrewsbury: I congratulate my colleague on her reply to a general practitioner on the above subject (Sept. 11, p. 349); but the patients to whom she refers are seeking relief because "they feel they are abnormal." Four questions were asked, and they do not seem to be answered dogmatically and unequivocally enough to bring the required relief. (1) *How widespread is this practice?* It is almost universal. Certainly more than 90% of normal women have masturbated at some time or another in their lives. It is commoner in women than in men for a variety of reasons, one being that the habit can be acquired and carried out "innocently." Havelock Ellis quotes the case of a lady of title, the president of a society for the suppression of vice, who discovered to her horror that she had been masturbating all her life without knowing what she had been doing! A practice so widespread can hardly be regarded as abnormal, and an appreciation of this fact should help to relieve the anxiety of the patient. (2) *Can it cause physical harm?* The physician should inquire what his patient does to obtain relief for her state of tension. If she employs the usual methods of titillating the clitoris or labia minora, or of rubbing the edges of the latter together in some way, he can conscientiously assure her that no physical injury will result. Certainly no more than from sexual intercourse. If she introduces foreign bodies into the vagina or (in rare cases) into the urethra, there is a risk of physical injury. It is important to ask what method the patient uses, and not whether she uses an artificial substitute for the male organ. The latter form of interrogation may suggest ideas which would not otherwise occur to the patient. If she has already adopted the latter technique, it will not be difficult to persuade her to discontinue it in favour of less injurious methods of producing the same result—orgasm and a relief of tension. (3) *Can it make normal intercourse less satisfactory?* A patient asks this question because she has already discovered, or has been told by a dissatisfied friend, that masturbation is preferable to marital intercourse. Comparisons are odious, but the underlying assumption is that she obtains complete sexual relief through masturbation, whereas she is left unsatisfied after conjugal union. She will be relieved to know that the fault may lie not with herself but with her husband. It is he (when he returns from over-seas) who may need the advice of a psychiatrist or physician. He may be thoughtless and selfish; he may have neglected the preliminary caresses which are so necessary for a woman before she can obtain complete gratification from the man she loves; or (the most common cause of marital dissatisfaction and nervous disturbance) he may, in good faith, practice coitus interruptus or "withdrawal." (4) *How can they be helped to overcome the habit?* A word of caution is necessary in answering this question. Masturbation is a sedative, and a comparatively harmless sedative, to the normal woman, provided it is practised within reasonable limits. Immediate cessation will certainly increase her sexual tension, and may precipitate nervous symptoms: an illustration of the cure being worse than the disease. If the habit is to be "overcome" it must be done gradually. A frank discussion of the first three questions in language which the patient can understand, and the measures suggested towards the end of the reply on page 349 (to which this letter is merely a supplement) should be sufficient for all normal individuals. In conclusion, I would like to endorse the opinion of my sister psychiatrist, that it is usually the neurotic who seeks advice; and that the neurosis is due not to physical but to mental traumata—feelings of guilt and anxiety, a sense of inferiority, etc.

Parodontal Disease

Mr. R. V. TAIT, L.D.S. (Rickmansworth) writes: With reference to the question about bleeding gums (Oct. 23, p. 534), I should like to say that bleeding from the gums may be a symptom of gingivitis but is not necessarily a symptom of pyorrhoea alveolaris. Unfortunately there is much looseness in the terminology applied to parodontal diseases, and any case of marginal gingivitis where a purulent discharge can be expressed around the teeth is often described as pyorrhoea. The term "pyorrhoea alveolaris" implies a lesion of the alveolar bone. While a marginal gingivitis of long standing may result in progressive destruction of the alveolus, there are other cases in which the bone loss cannot be traced to any local cause but appears to be a bone dystrophy of obscure origin. It is this latter variety that can be described accurately as pyorrhoea alveolaris, and this is also the variety of parodontal disease for which no satisfactory treatment is known other than extraction of the teeth. In these cases, although pockets may be deep with a marked discharge of pus, marginal gingivitis and bleeding are sometimes remarkably absent. It should be emphasized that parodontal disease arising as a marginal gingivitis from local causes may be treated successfully even when it has caused bone resorption to a marked degree. Many teeth that might be conserved are being extracted because of a misdiagnosis of pyorrhoea alveolaris, when there is really no more than a chronic gingivitis. Gingivitis may arise from a variety of causes, most of which act as direct irritants to the gum margin. General lack of oral cleanliness, deposits of calculus upon the teeth, ill-designed dentures, or faulty restorative work are among the most frequent causes, but irregularities of occlusion of the teeth play an important part. Treatment essentially falls within the province of the dental surgeon, entailing the correction of local factors exciting the inflammation and the elimination of all pockets, but the success of treatment depends upon the thoroughness with which the patient carries out a simple but precise daily routine of oral hygiene. Mouth washes and vitamin preparations, as are frequently prescribed by physicians, seldom alleviate symptoms, and do nothing to produce a cure because they fail to eradicate the cause.

Action on Uterus of Antispasmodic Drug

Dr. M. GHOSH (Burton-on-Trent) writes: The following case has convinced me of the antispasmodic action of trasentin on the uterus, which may prove of value in various obstetrical and gynaecological conditions. A nullipara aged 40, with irregular menstrual history, was examined by me at an early stage of pregnancy. She gave a history of three previous pregnancies, ending by abortion between 16 and 20 weeks. I attended her in one about 6 years ago. I put her on a regime of vitamin E, thyroid, and luteal hormone. During what I estimated as the 16th week of pregnancy she had backache, which gradually got worse, and had spasmodic intermittent pain over her lower abdomen, accompanied by visible and palpable uterine contractions. Injection of 1/4 gr. morphine gave some relief of pain but little change in the uterine contractions. After about 12 hours one ampoule of trasentin was injected intramuscularly and two tablets given orally. The relief of pain and spasm was obvious. Another injection was given in 12 hours, and four more tablets orally. Now there was no pain or contraction. Although there were no pain or uterine contractions one injection and 6 tablets were given daily for 3 days. The pregnancy has proceeded uneventfully to full term. She is waiting the onset of labour any day.

Tropical Bubo

Dr. R. N. HALL (Kano, Nigeria) writes: I was interested in Brig. Stammers's article (May 29, p. 660). We treat large numbers of these cases and find that intravenous injections of Ducrey's bacillus vaccine are by far the best. The injections are given on alternate days, starting with 250 million bacilli and increasing the dose according to the reaction. Most cases need only three injections. When we are short of vaccine we use intravenous boiled skimmed milk, and have found it more satisfactory than anthiomaline or T.A.B. vaccine. We have not been able to find Ducrey's bacillus in the pus from the buboes. Any surgical intervention or local application, other than aspiration, is unnecessary and inadvisable.

Chemotherapy in Intestinal Infections

Capt. I. S. DALTON, I.M.S., writes: I notice that Dr. Austin Clay ("Sulphonamide Chemotherapy of Intestinal Infections," July 10, p. 35) used 2 drachms of sodium sulphate night and morning for his third group of patients. Is not this drug much more effective when given two-hourly or four-hourly? Might not this method of administration have influenced the progress of these patients unfavourably? Twenty days seems rather a long time for cure in cases of "a mild character."

Treatment of Sciatica

Dr. B. H. SHAW writes from Totnes: I was surprised to note in Sir Arthur Hurst's article on "The Treatment of Sciatica" (Dec. 18) that no reference is made to local inductothermy, which I have found very successful even in cases of quite definite traumatic origin. I was under the impression that it was commonly prescribed where the apparatus was available.

Oedema of Ankles in Hot Climate

Dr. W. WATSON NEWTON writes: On a voyage round Africa as S.M.O. of a troopship I suffered from a simple form of oedema of ankles which was so pronounced and persistent that it was with relief I found there was no albumin in my urine. Off the West Coast for 10 days or so of tropical heat I had no signs and it was only after a week or more of profuse sweating in the Red Sea area that the oedema appeared. My idea is that the condition is due to a change of the saline contents of the blood plasma caused by saline loss through sweating, and appears in the ankles as the most dependent parts of the body, where fluids would most likely gravitate. The oedema was always much improved by the night's rest, and disappeared as soon as we reached a cooler climate.

Correction

The last sentence of Dr. Wilfred Harris's letter on "The Treatment of Facial Palsy" (Dec. 25, p. 828) contained an unfortunate misprint. It should have ended "unless the nerve is *decompressed* or grafted."